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THE NOTION OF ARBITRARINESS IN STRUCTURAL STATEMENT AND RESTATEMENT I: ELICITING

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0. Scope
1. Tübatulabal first statement derived from
 1.1. Text eliciting
 1.2. Shared morpheme eliciting
 1.3. Ancillary eliciting

0. If the demonstration of non-unique solutions for any problem in structure makes arbitrariness possible, then instances of restatements in linguistics are, in fact, more concerned with arbitrariness than are first statements which structuralize previously unknown linguistic materials. The latter are concerned with arbitrariness too, insofar as different first statements about a given linguistic structure can be obtained by different methods of field work.

Attempts are now being made to resolve or comprehend what is arbitrary, in either case; but in two different ways. For the resolution of arbitrariness in two or more non-unique solutions, evaluation criteria are beginning to be offered, largely under the influence of Noam Chomsky. And similarly, then, for first statements in linguistics, explicit decision among methods of field work is analogous to an evaluation criterion for a given solution in restatement linguistics.

In both cases, the resolution provides a rather dusty answer since (1) the non-unique solutions or alternate methods become unique only according to one criterion or one decision (but among multiple criteria, the problem is simply shifted from non-unique solutions to non-unique criteria of evaluation—and so analogously for methods and decisions in field work); and since (2) one explicit decision in field work methods might not necessarily lead to just one structuralization in the hands of equally competent analysts (if one assumes that some variables in analysis are derived by unwitting individual differences among analysts); and since (3) different methods in field work might lead to the same structuralization (though one could not be sure of this ahead of time; still it would be possible in favorable cases to experiment with more than one method in the hands of more than one analyst). In the continuous history of the analysis of a given language, beginning at the time when it is wholly unknown, multiple methods in original analyses might lead to unique or non-unique solutions; the latter would provide materials for the application of evaluation criteria with results which would either lead to unique solutions, or else complete the circle—lead back again to non-unique solutions.

Some aspects of this problem are common to science and social science, and not peculiar to linguistics which I take to be a more or less mathematicized branch of the humanities.

In chemistry, Lavoisier and Scheele once solved the same problem by two different discovery procedures. Those of Lavoisier were those initiated by physicists—weighing and measuring; those of Scheele were on the qualitative side, preparing new compounds and thereby discovering new reactions. Two hundred years ago, Lavoisier "boiled a *weighed* quantity of water in a *weighed* 'plican' . . . The weight of the flask . . . diminished, while the sum of the weights of water and sediment was greater than that of the original water by a practically equivalent amount, showing that the solid ma-

terial had come from the glass and not from the water. Scheele proceeded differently . . . he tested the sediment qualitatively, and finding that it contained potash, silica and lime, which he knew to be constituents of glass, he came to the same conclusion as Lavoisier."[1]

In cultural anthropology, and perhaps in social science generally, the characteristic notion of arbitrariness is that familiar to linguists who work in typology which differs from the arbitrariness problem involved in structural statement and restatement. Evaluation criteria seem to offer some hope for resolving non-unique formulations in structural linguistics, but gives very little more than clarification of statement in linguistic typology and in culturology. That the clarification consists chiefly in unmasking (converting the masked arbitrariness in a problem to an explicit statement of what is arbitrary in it) is apparent in White's discussion of the definition of culture, in which he cites Sapir's distinction between one type of behavior which is grist for 'culture' (behavior shared by or having impact on others), and another type which is not (non-shared and non-influencing individual behavior). Both Sapir and White say this distinction is arbitrary. Just as one selects some criterion for inclusion in a linguistic typology (e.g., the inventory of unit phonemes, or Distinctive Features, out of the totality of phonologies without reference to their interphonemic specifications), so also a criterion is set up for distinguishing one kind of behavior out of the totality of all behavior: "the differentiation of these two types is essentially arbitrary, resting as it does, entirely on a principle of selection" [Sapir]; the distinction "between 'culture' and 'not-culture' is purely arbitrary" [White]. But White goes further than Sapir—or anyone else who appreciates the uses of typology; White says that the selector of the criterion for inclusion and exclusion makes a 'subjective evaluation' (hence, in our terms, the lines of the distinction drawn by two or more selectors would be non-identical); and that this will be so as long as there is selection or, in effect, until typology is replaced by structuralization.[2]

The kind of arbitrariness associated with typology may well be avoided when the problem shifts to total accountability in structuralization. Sapir's position was of course not that of avoiding it; his sensitiveness to typology or, more generally, to genuine contrast (and even conflict) permitted his formulation of the impact of culture and personality. So also, in the linguistic exemplification which follows, typology permits some formulations which would be impossible if the scope of this paper did not extend a little beyond structuralization.

The notion of arbitrariness has been associated with structural restatements since 1934 when Y. R. Chao raised the question of non-unique solutions. It may be usefully extended to alternate methods for obtaining structural first statements, since it simulates explicitness. And two consequences of applying criteria of evaluation to non-unique solutions in structural restatements (and, analogously, explicit decisions to alternate methods in field work) are, first, that the problems of each are somewhat generalized and, secondly, that whatever interdependence exists between the two—between con-

[1] F. H. Moore, A History of Chemistry (New York, 1918; pp. 48–49).

[2] The minimum terms for covering all culture are (1) 'symboling'—'man's unique ability to symbol'; and (2) 'symbolate' (on the analogy of 'isolate' resulting from the process or action of isolating); and (3) 'extrasomatic context' which seems to me merely another label for Kroeber's 'superorganic' whose validity Sapir was questioning in the passage cited by Leslie A. White, The Concept of Culture, AA 61.245 (1959). White does not explicitly speak of typology but the objection which he makes is an objection which is often made against typology; to avoid this kind of selection inherent in typology, White strives for comprehensiveness, and does in fact approximate a non-arbitrary comprehensiveness, but in terms which are difficult to define.

structing grammatical theory (for all languages) and discovering particular structures (for the genius of just one language, or for sets of languages classed together on the basis of genetic or typological similarities)—may be pin-pointed instead of being expressed in such sweeping terms as to be almost universal ('model-directed structuralization'), or wholly universal (that the demonstraction of the validity of a particular structure amounts to a demonstration that its structuralization follows from universally applicable theory).

Anthropological linguistics is characterized by structural first statements rather than by structural restatements. Since the latter are here restricted to restatements made without further field work (as in the example of Tübatulabal), it is possible to speak of more than one first statement—i.e., when the repetition of analysis of a given language is based on fresh field work (as in the examples following of Kutenai and Yokuts). The Crow example provides an instance of first statement by Lowie, and another first statement by Kaschube; and then of two structural restatements by Hamp and by Matthews, respectively.

Tübatulabal is taken as the main exhibit for this paper because a single author made a first statement of the structure of this language and then (without further field work but with collaborators) two structural restatements. One restatement integrates the morphophonemics of Tübatulabal in terms of rules and innovated morphophonemes beside the additional use of phonemic orthography for morphophonemic values. The other restatement of Tübatulabal is influenced by the parallel structures of sister languages in the same language family.

The phonemes of a given language are discussed only when, as for Crow, phonemic solution is affected by restatement; but not when the change is from pre-phonemic or phonetic to phonemic orthography, as for Kutenai and Yokuts; and not when, as for Tübatulabal, the phonemic solution in the first statement remains in the subsequent restatements.

The relevancy of meaning is asserted in one grammatical theory, and denied in another. In structural restatement linguistics, the strongest stimulus for making a fresh analysis of a known language seems to be new formulations in grammatical theory, irrespective of whether the formulations include or exclude consideration of meaning. Thus, John Lotz points out that Diderichsen writes one description of Danish (1946), and three years later a restatement ('a completely deviating description of the structure of Danish in the Hjelmslevian glossomatic spirit', Word 7.87). As soon as two or more deviating descriptions are made of a given language, considerations or, rather, further considerations of meaning are irrelevant to reducing the deviating descriptions, by evaluation techniques, to one validated description.

If description can ever be validated as unique in linguistics, it would be efficient to reach this objective in a first statement in field work. Such efficiency would, in one sense, make structural restatement linguistics supererogatory (but see **2**, in part II of this paper). As matters stand, what precedes in field work appears to many linguists to be an historical prior activity for accumulating archival-like corpora of combinable materials—on the dubious principle that discovery precedes formulation. If the two (discovery and formulation) are interlocking, as is reported by everyone who has worked in anthropological linguistics, then the kind of questions which are asked in making structural restatements have to be asked in constructing the first structural statement—including the relevancy of meaning, and the basis of decision when facing alternative analysis.

If considerations of meaning are irrelevant to finding structural elements and their combinatorial classes in a previously unknown language, these considerations are irrelevant in a different sense than they are

to evaluation criteria. It may be shown that though informant responses to referents are relevant in eliciting (see **1.2** especially), it is still the variety of decisions possible in analysis—rather than the variety in informant response—that makes non-unique solutions possible.

Of the three main ways of obtaining information for structural analysis, text eliciting is relatively free from arbitrariness (**1.1**, method *x*). One undesirable consequence is a closed corpus grammar: the grammatical rules obtainable from the exclusive use of text eliciting are *de facto* rather than predictive rules.

By combining or following text eliciting with shared morpheme eliciting (**1.2**), a half open corpus is obtained and grammatical rules become predictive for some utterances not yet made. There remains this restriction—that the to-be-made-in-future utterances are valid only when they are no longer than citation forms of words or short phrases.

By combining text eliciting (**1.1**) and shared morpheme eliciting (**1.2**) with ancillary eliciting (**1.3**, below), the corpus is open; but still not fully so. Structural rules are predictive for utterances of phrase, sentence, and paragraph length. But there still remains, after ancillary eliciting, a restriction on what is appropriate or inappropriate by selection; for example, beside many imperative sentences on the model of English *wink at me! (at us! at him! at them!)*—where **wink at you!* is never selected—there appears by selection (a *de facto* or closed corpus list, instead of a fully open corpus or generating-all-utterances rule) *look at you!*

1. For the first presentation of Tübatulabal morphology-syntax, the published corpora include (1) texts,[3] (2) a working dictionary,[4] and (3) a grammar.[5] These three corpora reflect respectively three kinds of eliciting, as given below, **1.1–1.3**. Some workers, as Bloomfield, favor the first and last, almost to the exclusion of the second (Lg. 35.109–25). The second kind of eliciting is favored when an informant is imported for purposes of classroom demonstration of methods of field work—from the example of Franz Boas, in the first decades of this century, to today's characteristic demonstration in Linguistic Institutes and university seminars which employ an informant for exhibiting field work methods (AL v.1, No. 1. 9–25); these demonstrations have at least succeeded in exhibiting one out of three main methods or kinds of eliciting. The third kind of eliciting discussed below is that generally followed, with some differences of emphases, in the actual field work phase of anthropological linguistics—as opposed to seminar demonstration; multiple informants are more apt to be available in the field than in the seminar room (SJA 9.59–75).

Some Tübatulabal informants responded more cooperatively to one or another of these three kinds of eliciting. It soon became apparent that eliciting, out of practical necessity, varied with informant's preference. More importantly, it varied also according to the elementary or advanced stages of field work, and according to the corpus to which the eliciting was most relevant. Since the central goal of field work was to construct a grammar, those informants who responded well to the kind of eliciting given under **1.3** were employed more than other informants who exhibited other preferences and predilections in informant sessions.

1.1. The first kind is concerned with what is sometimes called 'text eliciting' which includes some stages of translation. However, for purposes of discussion in this section, it excludes the eliciting of Tübatulabal words from the informant in response to 'how do you say . . .?' questions. When such responses are obtained (**1.2**, below), they are distinguished by the label CITATION FORMS from the responses discussed here. Accordingly, the label TEXT ELICITING is

[3] C. F. Voegelin, Tübatulabal Texts, UCPAAE 34.191–246 (1935).

[4] C. F. Voegelin, Working Dictionary of Tübatulabal, IJAL 24.221–28 (1959).

[5] C. F. Voegelin, Tübatulabal Grammar, UCPAAE 34.55–190 (1935).

used here in a sense which is both extensive—including at least some approximation to translation from the source language (Tübatulabal) to the target language (English)—and at the same time restrictive, since CITATION FORMS are not now included under the cover term TEXT. (The latter still permits the expression 'a one word text' so long as it is understood that the 'one word' was not obtained in response to a 'how do you say . . .?' question.)

The whole point of this careful delimitation of text eliciting is to find some variables in methods (among the many which are possible in operations having to do with transcribing and understanding what an informant says) such that a difference in decision to follow method x rather than method y might yield a difference in resulting statement. Method x is taken to be the so-called monolingual approach; method y the bilingual approach actually followed in work with Tübatulabal.

To follow method x one has to learn the informant's language before being able to understand what the informant says in a text; hence the so-called monolingual approach is not, in fact, monolingual. It is merely the linguist instead of the informant who is bilingual in following method x. Having learned the source language, the linguist converts his understanding of the transcription—utterances in the source language—given by a monolingual informant, or by any informant treated as though monolingual—into the target language.

(This method x conversion by a bilingual linguist is often asserted to be the only valid method; it resembles but is not really the same as method x'—being one's own informant in one's mother tongue. The English speaking linguist analyzing his own English does so in a way which, by definition of x', cannot be invalidated by the introduction of non-native expressions. But x' can be invalidated by the fact that the English speaking linguist appreciates the linguistic objective of his analysis. He may therefore be influenced in his selection and avoidance of utterances for analysis—precisely by his knowledge of the goal of the linguistic analysis. This seems to me to be the one non-vague feature in what is sometimes referred to as 'intuition'. Such intuition is advantageously lacking in informant selection, however natively intelligent the informant may be. To know the goal of linguistic analysis, the informant would have to be trained in linguistics.)

To follow method y, one has to work with a bilingual informant whose selection of utterances, in non-directive interviewing, is quite as free from invalidation as when the same informant is involved in the first method; this, then, does not distinguish method y from x. The difference lies not in the selection or transcription of the text, but in the understanding of the text. Following method x, the linguist may write a gloss under each word-like stretch in the text of the source language, from knowledge gained in whatever context he learned the source language. Following method y, the linguist may play back a contour span of speech from a tape recorder, and ask the bilingual informant to supply the appropriate glosses for the stretch of speech in one contour span (between pause junctures). It is now expectable that multiple glosses for different occurrences of a given word in the source language will show a wider referent range in method y than in method x, since the informant is more responsive to extension of referent range in different contexts in the source language, in which he has grown up, than is the linguist for whom the source language is a second language.[6]

In Tübatulabal text eliciting, informants dictated texts—word by word or phrase by phrase—since tape recorders were lacking.

[6] Decision to follow method x, nevertheless, is of course made for other purposes, as to obtain communication with many persons in cultures which are mostly monolingual—for administrative or anthropological or missionary interests. Method x was used for linguistic purposes alone by Leonard Bloomfield who appreciated that method y implied subsequent shared morpheme eliciting (**1.2**, below), which he wished to avoid.

In the first stage of translation, the same stretches that were dictated were read back by the analyst ('imitating' or 'repeating'), and glosses were supplied by the informant. Though the informants would talk as they pleased in dictation (with somewhat more restriction on speed than dictating to a shorthand stenographer), this wholly non-directive eliciting[7] did not extend to the part of the text eliciting having to do with understanding the text.

Each dictation session was followed by an interpreter session (the interpreter might give more in the target language than was dictated in the source language; or he might give much less). Interpreting the text as a whole or in larger parts provided satisfaction to the informant, but some insurmountable difficulties to the analyst—difficulties in matching between Tübatulabal and English.

Gloss or interlinear translation required expanding directions for going from the source to the target language. If the informant was unable to give a gloss to the first word or two from a Tübatulabal sentence (direction: "what does 'píšnin' mean?"), a longer stretch of utterance from the same sentence, including the first word, was read back (direction: "what does 'píšnin ʔala·winát' mean?"), and so on, until the informant would translate. And some sections of a text were left blank—not supplied with interlinear gloss in this stage of translation.

[7] All texts obtained in Tübatulabal are categorized as non-directive, whether the informant dictated an anecdote, a dream, a folktale, or a whole autobiography. One might stimulate one kind of text rather than another—e.g., by asking 'Do you know any more coyote stories?' or by guiding general conversation to the subject of the informant's dreams or other memories and then taking the occasion to ask for the dream or autobiographic episode to be recounted in Tübatulabal. The informant was thus guided up to the point of giving a text; but once launched on a text, he spoke as he pleased, just as our Hopi informants today are free to say what they please in response to projective association made when viewing pictures, or in joining friends before a microphone for tape recorded conversation.

In the non-directive phase of text eliciting, the bilingual informant speaks exclusively in his mother tongue (the source language), and thereby gives a text. In the quasi-directive phase of text eliciting, the same informant responds to successive stretches in his mother tongue (imitated or repeated by the linguist with inescapable variation; or replicated without variation in playback from the tape recorder); but he responds entirely in his second language (the target language). Such informant response is certainly not to be confused with an adequate understanding of the text to which it contributes only in making further eliciting possible in the same context; an adequate understanding of the text implies that a grammar—a grammar which gives combinatorial rules for the utterance constituents occurring in the text—is also understood in one way or another, depending in part on the different kinds of eliciting followed in constructing the grammar.

1.2. Tübatulabal informants would not respond to the shorter utterance cited above (píšnin); but when this was expanded in reading back from the text (píšnin ʔalá·winat), informants would respond with relevant information which appears in smooth translation as *Then she is talking to me*. To attest a gloss translation with English interlinear matching the Tübatulabal, as in

píš-nin	ʔalá·winat
then-me	*she-is-talking*

variables are elicited (e.g., for marking different persons in the goal). The gloss, English *me*, can be surely matched with the Tübatulabal form -nin when the latter is known to be substitutable by another form, as -tipi, which is matched by another gloss (*them*), as shown below.

Some substitutable possibilities (at a given point in an utterance) are already known by the linguist if he is able to compose new utterances in the source language—and this amounts to a definition of ability to speak

the source language. If not, or if the linguist is distrustful of composing new utterances, the knowledge needed for such matching (between interlinear gloss and a specific item in an utterance already transcribed) is obtainable from a bilingual informant, despite the fact that the informant does not comprehend why a variable of a given utterance is wanted.

But in obtaining such a variable, a second kind of eliciting is introduced, hereinafter termed SHARED MORPHEME ELICITING. In both this and in the quasi-directive phase of text eliciting an assumption is made—that there will be at least some co-variance of form and meaning in every natural language. In TEXT ELICITING, the form is played back or read back by the linguist (píš-nin ʔala·winát) and the informant contributes the meaning (*Then she is talking to me*); in SHARED MORPHEME ELICITING, the meaning is given by the linguist ("how do you say *Then she is talking to them?*") while the informant responds with the form (píš-tipi ʔala·winát).

Shared morpheme eliciting begins with a form taken from a text, as above, or else begins with a citation form obtained in response to a 'how do you say . . .?' question, and then immediately seeks to obtain another form or set of forms (in response to successive 'how do you say . . .?' questions) such that one morpheme or one sequence of morphemes or an enveloping morphemic frame in the pair or small set will be shared and thereby represent a constant (e.g., above: píš- . . . ʔala·winát) which is combinable with whatever variables are obtained (e.g., above: -nin, -tipi).

Shared morpheme eliciting is only incidentally concerned with paradigms. Paradigms are but special instances of sets which have special defining features of their own (**2.** in part II of this paper).

In the more general and not paradigmatic-bound sense, shared morpheme eliciting is (a) wholly directive, (b) limited to citation forms of words and short phrases, (c) conducive to finding restrictions on combinability among morphemes and thereby leading to or revealing both (d) low inventory lists or morphemes which are highly recurrent, and (e) morpheme lists which are high numbered, *qua* inventory, rather than *qua* recurrence, as well as (f) alternate places at which morpheme cuts can be made in terms of minimum stretches of phonemically constituted morphemes.

As will appear in the following—(a) to (f), below—the defining features or procedures of shared morpheme eliciting are not entirely free from arbitrariness. What is said is supposed to be ecumenical for some features, as (a) and (b), but restricted to languages which are like Tübatulabal in morphological subtype for other features, as (d) and (e). In other words, it seems probable that typology is relevant to the discussion, even when the permissive criterion of arbitrariness is taken to be non-uniqueness (**0**, above).

The question now arises as to whether response to referents by the bilingual informant might not also lead to non-unique solutions, and hence arbitrariness. As defined, shared morpheme eliciting is procedurally possible by virtue of introducing change in referent—presenting the informant with variables in meaning and assuming his responses will show some degree of co-variance in form and meaning.[8] In view of this, a flat denial of the relevancy of meaning to shared morpheme eliciting might seem para-

[8] But shared morpheme eliciting is not an inescapable procedure in anthropological linguistics; the alternative already mentioned (method x in **1.1**) is to learn to talk a language before analyzing it. This alternative is actually followed both by an occasional academic worker and by the whole army of Wycliffe Bible Translators. A discussion of this alternative in terms of response to referents which are no longer directly given by the informant—but by the linguist who is now both a learner and analyst of the source language—would be more complex, since it would involve learning theory, and also the influence of one's native language on learning a second language.

doxical. Rather, it is possible to show, in the discussion following (a–f), that the linguist's motivation in proposing changes in referent is to elicit combinability among forms; and that any non-uniqueness in solution is easy to state in formal terms, but difficult to state in semantic terms.

(a) Shared morpheme eliciting is wholly directive. The informant is directed to respond in his mother tongue, and not to comment in the language in which the 'how do you say . . .?' questions are put. The selection of each successive question is influenced by the informant's response to the prior question, which is transcribed before the next question is asked. If two or more successive responses show no shared morphs, the objective of shared morpheme eliciting has not been reached. If two or more successive responses show all shared morphs except for one each in a given pair of responses, the immediate objective has been reached. (This clearly distinguishes shared morpheme eliciting from the kind of dictionary compilation in which tedious lists of non-resembling forms are obtained and alphabetized.)

(b) Whatever was said in response to 'how do you say . . .?' questions was transcribed in Tübatulabal; but successive questions were put in such a way that the informant was stimulated to reply in one word or short phrase citation forms. There was a double purpose in keeping the response brief: (i) to minimize the influence that English referent order (e.g., attribute-head) might have on alternative possibilities of ordering in Tübatulabal; (ii) to explore or check alterability in relative order—the restriction on transposition—among two or three or four morphemes in brief utterances (as against many morphemes in longer utterances which, as any casual inspection of texts would show, might appear in more than one relative order). Certain 'how do you say . . .?' questions were asked over and over again, but at random among other questions, until it became clear that some constituents in brief utterances were transposable, while others were not. In many languages, constituents in word morphology are, in general non-transposable. In Tübatulabal all operators (e.g., different reduplicative morphemes) are non-transposable, i.e., each is combinable in a single way with a base. On first eliciting, some suffixes seemed non-transposable—such closing suffixes as actor marking third person (-t) versus first person (-ki) in ʔala·winá-t *she is talking* versus ʔala·wina-kí *I am talking*; one or another closing suffix appeared after a dependent base—an unalterable sequence, it seemed, but later a way was found to elicit transpositions even here. Other suffixes are transposable but still remain suffixes since they appear in all utterances bound to a prior base; they are transposable from an introductory base (cp. -nin ~ -ni, cited above: píš-nin *then-me*) to a position after final base and closing suffix (píš ʔala·winátni *then she is talking to me*). In pairs of longer utterances than this—frequently encountered in non-directive texts (**1.3**)—expansions (additional words) co-occur with one transposition and contractions (fewer words) co-occur with another transposition—as if the /píš/ in píš-nin/ were incompatible in an utterance in which /-nin ~ -ni/ were transposed to the following word. But when sufficiently long 'how do you say . . .?' questions are put to amenable informants for eliciting longer utterances, these co-occurring expansions and contractions are suppressed in informant response, and instead the relative order of referents in the English question influences the Tübatulabal response. Hence 'how do you say . . .?' questions are limited to those which serve to elicit single word or short citation form phrases with minimum referent order influence. Thus the English order of referents in the short questions (*Then she is talking to them*) did not influence the Tübatulabal order in the response (*then-them is-talking-she*). The fact that the referent order in informant response differs from the referent

order in the 'how do you say . . .?' question is taken as evidence that the informant is not unduly influenced in shared morpheme eliciting.

(c) Having obtained timiwál *chief*, it is possible to ask 'how do you say *chiefs*?'; the response will be timiwál again, whose referent range is accordingly extended to include plural (*chief*, *chiefs*) or, in other words, the gloss of tímiwal is *chief*, irrespective of number. Having obtained kula·bíšt *duck*, it is possible to ask 'how do you say *ducks*?'; the response will not be a repetition of kula·bíšt, but instead ʔukula·bíšt. In formulation, R (a kind of reduplication in which the first CV of the stem is exfixed, and the initial consonant of the stem replaced by /ʔ/ in the exfix) combines with a noun stem (N); then R + N marks plural of noun. But there are restrictions on the combinability of R + N which may be stated in terms of subclasses of N—those N which are combinable with R as R + N fall in one subclass (kula·bíšt belongs here); those N which are incompatible with R, which do not appear in R + N, fall in another subclass of N (timiwál belongs here). However, if one asks 'how do you say *chief who has many followers*?', the informant response will not be a repetition of timiwál but instead timiwawá·l (and it is also possible to obtain beside timiwáp *their chief*, timiwawá·p *their chief who has many followers*). In formulation, this can be stated as another R morpheme (a kind of reduplication in which the last CV of the stem is exfixed, with alternation of length in the vowel); then N + R marks plural allegiance of the noun. The restrictions on the combinability of N + R may be stated in terms of the shape of N—another subclass of N but predictive (statable by rule for to-be-made-in-future utterances), in contrast to R + N, which is statable by list (closed corpus). So also a third subclass of N is restricted by list, but in addition restricted by co-occurrence of two suffixes, -mi· (marking intensive plural) and a closing suffix marking possessor; however, the closing suffix marking nonpossessor (the so-called absolute) is incompatible with preceding -mi·—hence, the responses to 'how do you say one *skirt*? *skirts*?' are identical: ya·bíl *skirt*, irrespective of number. But when the possessor is included in questions 'how do you say *her skirt*? *her very many skirts*?', the second response is distinguished from the first by the inclusion of the suffix -mi· before the closing suffix -n (ya·bín *her skirt*; ya·bimí·n *her very many skirts*).

(d) Shared morpheme eliciting proceeds in the same way, irrespective of whether the combinability of an operator or affix is broadly restricted to a major morpheme class (e.g., compatible with all N but incompatible with other major morpheme classes), or narrowly restricted to a subclass of one major morpheme class (e.g., R- is restricted to some N in R + N, and another -R is restricted to other N in N + R); informant responses yield not only the shape of the operator or affix, but (if enough responses are obtained) the class or subclass determining combinations in which the affix and operator appear. Hence the resulting list of operators and affixes are certainly not a list of items, like a laundry list, whose arrangements are subsequently to be investigated. This misleading impression is derived from grammars which divorce the combinatorial sequence in which the affixes and operators are discovered (through shared morpheme eliciting) and treat major morpheme classes in other sections than those which list the affixes and operators. The latter may be termed minor morphemes in a statistical sense, since they are relatively low numbered in inventory count, however, recurrent they may be in text frequency (low in inventory, but generally high in text frequency). In Tübatulabal the inventory number of minor morphemes adds up to fewer than a hundred operators and affixes; the latter are inhospitable to direct borrowing from other languages while major morpheme classes are not (e.g., a verb stem

(V) lo·go?o- is borrowed from Spanish loco *crazy*, and is then combinable with minor morphemes like any other intransitive V; but with transferred meaning, the Spanish borrowing appears in sequence after native Tübatulabal V as a by-form suffix in the shape of -ilo·go *simulating, making pretense at . . .*).[9] Having obtained a suffix like -mi· in response to asking for plurals of some nouns (but not all), it is possible to assemble forms out of texts which not only include -mi· but also, and always, a following possessor suffix; this particular co-occurrence, as already mentioned, is obtainable from shared morpheme eliciting. So also is the restriction on the occurrence of -mi· in sequence after some rather than all N. The question arises as to whether the informant, having responded with a N + mi· + possessor suffix for one N (ya·bi-, as cited above: ya·bimí·n *her very many dresses*) will or will not respond with parallel forms, falsely analogizing from N (yaíbi-) + mi·- to N (kulabiš-) + mi·- in directive eliciting; but not extend the combination of -mi· with the second N (kulabiš-) in non-directive eliciting—that is to say, in texts. This question is so often answered affirmatively that it deserves a special label THE TRADITIONAL DECISION: the informant will be so tempted and hence texts are the only reliable way to establish paradigms in particular, and the affix and operator constituents of a language in general; this certainly is the assumption behind linguistic statements derived wholly from texts. By definition, this means closed corpus linguistics, formerly known as philology. But anthropological linguistics operates with an open corpus since it seeks predictive rules through shared morpheme and ancillary eliciting (**1.3**, below). It attempts to predict whether the suffix -mi· will occur after all N, and succeeds in saying that it will not; it distinguishes between a particular sequence of *N* + mi·- obtained from one informant and from many informants. If many informants are similarly tempted by the same parallelism, and all falsely analogize in the same way—as identified by the non-occurrence of the parallelism in texts—it becomes arbitrary to set up the texts as a crucial test of correctness, and, conversely, to put the stamp of artificiality on characteristic parallelisms which happen to be found outside of texts. Suppose an instance of the latter (to be called, now, a 'citation form') is non-occurring in extensive texts: and that by creating an appropriate parallelism in conversation (both linguist and informant talking in the source language), the informant uses the citation form in a non-directive utterance, in the course of his conversation (but not now in response to a 'how do you say . . .?' question). This, then, would amount to a conversion—from citation form into a text; or put the other way around, the new text, then, would attest or guarantee the citation form obtained by shared morpheme eliciting; or stated in terms of linguistic objective, shared morpheme eliciting seeks to obtain an open corpus type of prediction. Far from suggesting that the distinction between closed corpus and open corpus be blurred, every precaution is taken to keep the distinction sharp. By labeling the responses to 'how do you say . . .?' questions CITATION FORMS, there will be no confusion between them (directive utterances) and non-directive utterances made by the informant when he is free to choose or select; only then is his utterance labeled a TEXT

[9] For languages which include scarcely any affixes, it still seems possible to set up a distinction between minor morpheme classes and major morpheme classes as analogues of affixes and stems in languages like Tübatulabal which include circa 100 affixes. The minor morphemes would be those which are highly recurrent in text frequency, and relatively low numbered in inventory frequency. In some such more or less affixless languages, the major morpheme classes seem to be open to direct borrowing while the minor morphemes are not, just as affixes are less hospitable to borrowing than stem classes. And the non-bound type of minor morphemes seem also to co-occur with major morphemes in paradigmatic-like sets (Syntactic Paradigms, in Chao volume).

(**1.1**). What is arbitrary here is not the distinction itself, but the TRADITIONAL DECISION to accept the TEXT as an utterance guaranteed to be natural in a language, and to suspect that the CITATION FORM will be unnatural or artificial because it is influenced by parallelisms in successive 'how do you say . . .?' questions. When this TRADITIONAL DECISION is approached as a topic suitable for investigation, it leads to all sorts of interesting questions in place of the unquestioned acceptance of the TEXT: how to set up criteria for casual and non-casual utterances (after the manner of anthropologists concerned with cultural domains)? how to find criteria for degrees of grammaticalness (after the manner of logicians concerned with truth values)? how to stimulate—short of directing—the informant to convert CITATION FORM into TEXT (after the manner of psycholinguists setting up experiments)?

(e) Shared morpheme eliciting obtains dictionary like lists of morphemes which are high numbered, *qua* inventory; the major morpheme classes and subclasses of these are determined by the combinability of some minor morphemes with one or more but not all morpheme classes in the high numbered inventory. How far shared morpheme eliciting can carry the analysis to the linguistic objective of finding formal criteria for major morpheme classes depends on typological factors in the language under analysis. It can carry the analysis far in languages like Tübatulabal and Ojibwa which exhibit a high degree of co-variance in form and meaning, even though morphemic cuts are possible which lead to empty morphs (see (f) below). However, when the co-occurrence of two morphs involve restriction on one of the pair, and extensive referent range in terms of the restriction (rather than regularity of co-occurrence but without any referent for one of the pair), the crucial question is no longer 'how do you say . . .?' since the shape of the wanted morpheme is known but its referent range is either not known or not readily anticipated. For languages like those in the Mayan family and those in the Iroquoian family, the crucial question put in ancillary eliciting (**1.3**, below) is more rewarding than the 'how do you say . . .?' question of shared morpheme eliciting.

(f) Shared morpheme eliciting, because it provides so much parallelism, leads to clear-cut alternative possibilities in making morphemic cuts. Sometimes, as in Eastern Ojibwa, the choice is between (i) setting up subclasses of suffixes which have a partial phonemic resemblance; or (ii) segregating the resembling parts as incremental to the suffixes which do have co-variance of form and meaning (while the empty morph increments do not). Bloomfield's choice is the latter; he lists certain suffixes that are 'enlarged by sounds at the beginning'—a, a·, e·, e·w, ikw, mi, o·, w, yi· (Language 35.114). My own choice in a partially analogous problem in Tübatulabal was also to set up incremental vowels which lacked co-variance of form and meaning but which, unlike those in Ojibwa, might be supposed to belong to a prior morpheme (a preceding stem or preceding suffix) or a following morpheme (in that case, a suffix), or neither (in that case, empty morph). The empty morph choice still made it possible to speak of the co-occurrence of an -i- vowel with certain suffixes and of a non-i- vowel with other suffixes. Hence the vowels were incremental to the suffixes which did show co-variance of form and meaning; the incremental vowels did not. Shared morpheme eliciting made it unnecessary to have reservations about the regularity of the co-occurrence; it permitted the unreserved statement that verb suffixes in general were preceded by -i- or non-i vowel increments, even though the 'how do you say . . .?' questions had to be asked in terms of eliciting the suffixes which followed the empty morph -i- or non-i vowel increments. Empty morphs can accordingly be elicited once their co-occurrence with non-empty morphs is known. Alternative possibilities in making

morphemic cuts were brought in clear focus through shared morpheme eliciting which, however, was impotent in deciding among the alternative possibilities. One decision was made in the first presentation (the published grammar); another decision, based on a different evaluation criterion, will appear in the structural restatement of Tübatulabal (part II of this paper).

1.3. ANCILLARY ELICITING is almost as directive as SHARED MORPHEME ELICITING, but not quite. The latter can start *de novo*, with a series of 'how do you say . . .?' questions. Ancillary eliciting must start out with a text; it cannot start *de novo*, since the minimum question it asks is based on a non-directive utterance supplied by the informant. However, even though a text is not a prerequisite in the case of shared morpheme eliciting, it is of course possible to use a text as a starting point (e.g. the first example cited in **1.2**, above); hence, the initial use of text fails to distinguish the two kinds of eliciting. And both kinds of eliciting are directive, but in different ways. The difference lies in the type question which each asks; and the kind of objective which each attempts to reach.

Given a translated sentence from a text which has been read back to the informant—or played back, if the text is recorded on tape—the minimum question is 'Can you say the same thing with X (. . .)?' in which the linguist utters one word, X (. . .), in the source language in a query which is otherwise in the contact languages, as English. Hence the informant is not asked to translate, as he is in response to the 'how do you . . .?' questions of shared morpheme eliciting (which are put entirely in the contact language); instead of translating, the informant is asked to make a minor change in his own language—to repeat a non-directive utterance with the difference that X is used in place of the .Y in the original utterance, rather than to agree that it can be done.[10] This is the directive part of ancillary eliciting; the linguistic objective includes substitution as an incidental interest. (The important linguistic objectives are discussed below.)

Little that is new is obtained if the only difference between the utterance in the text and the repeated utterance is the substitution of X for original Y—little more than that the linguist knows enough to compose a partly new utterance, though he refrains from making the substitution himself in order to prod the informant into being responsible for all utterances in the source language. For example, after first translating and then reading back Tübatulabal, píš-nin ʔala·winát *then she is talking to me*, the query as to whether háš *not* can be substituted for píš *then* is put in ancillary eliciting as 'can you say the same with X (háš) instead of Y (píš)?'—rather than by composing the new utterance and asking for approval. The informant is directed to compose the new utterance, with the substitution in question included where possible, rather than to give blanket assent. Suppose the informant responds to the question just put with háš-nin ʔala·winát *she is not talking to me*. What is learned thereby is that the expected substitution is possible. But if the informant responds with píš-nin háš ʔala·winát an expansion of the original utterance is obtained—Y (píš) in the text is retained and the directive utterance is longer than the non-directive utterance by the inclusion of X (háš). If the informant

[10] Very amenable informants seem inclined to say 'yes' to the minimum question in ancillary eliciting; subsequently, however, they will repeat the original utterance, with X replacing Y (and with co-occurring transposition, contraction, or expansion) in response to a second request to make the substitution, since they admit it can be done. A different kind of second and third request is addressed to informants who say that the requested substitution of X for Y cannot be done—namely, to direct the informant to compose an entirely new utterance which includes the requested X, and then to repeat that utterance with Y (out of the non-directive text) in place of X.

responds with háš-nin píš ʔala·winát, an expansion of the same magnitude is obtained, and also a transposition of píš from the left to the right of -nin.

The minimum question in ancillary eliciting seems to ask for substitution, but such substitutions as are obtained are relevant to important linguistic objectives only when they show co-occurring (i) transpositions, and/or (ii) expansion and/or (iii) contraction—for (iii), the repeated utterance is shorter by the exclusion of a morpheme (as píš, above) found in the original utterance.

Leonard Bloomfield was in the habit of learning to speak a language while working with an informant. His method of learning—and of analysis—was an indirect kind of ancillary eliciting. As already noted, he wished to avoid any kind of directive eliciting, and in particular shared morpheme eliciting; he minimized the directive component of ancillary eliciting by himself repeating utterances—from an informant given text, to be sure, but in a new context. He would, of course, transcribe whatever the informant said when thus stimulated, but without explicit direction to the informant to make a substitution of X for Y. This came close to being non-directive, but was not wholly so. Bloomfield would instruct the informant to correct him (as one corrects a child) when he himself repeated an informant given utterance with substitution of X for the Y in the original text. This indirect ancillary eliciting obtained the same results—no less and no more—that are obtained in frankly directive ancillary eliciting: namely, substitution (made by Bloomfield) with co-occurring transposition, expansion or contraction (often revised or restored by the informant).

In all kinds of ancillary eliciting, the first linguistic objective is to obtain permissable or obligatory co-occurrence among non-contiguous morphemes (and conversely, to find pairs or larger sets of non-contiguous morphemes which are incompatible in a given utterance)—e.g., since the noun accusative suffix is incompatible with the imperative suffix, N in transitive V N phrases are nominative in Tübatulabal (paʔagináh ta·twál *hit the man*!); but since the accusative personal marker (P) co-occurs with the imperative suffix, P in P V phrases are accusative (píš-nin paʔagináh *hit me then*!). Suppose the V N phrase were obtained first; then one might ask the informant to repeat but with a person marker (-ki ∼ -gi for nominative first person), not yet knowing that the nominative P is incompatible and the accusative P is obligatory, as a matter of co-occurrence with transitive imperative V. The informant would make the substitution, and in place of N (for *man*) in the original utterance repeat P (for *me*)—with P (-nin) instead of what was actually but incorrectly given in the direction for P (-ki ∼ -gi). Imperative verbs are infrequently found in narrative texts; the rule here noted would not have been established in Tübatulabal without ancillary eliciting.

The following rule bearing on the case of actors in subordinate verbs could be established from non-directive texts alone—that there are two kinds of such verbs, one ending in -š (and other suffixes of the identical actor class), and the second kind of verb ending in -ŋ (and other suffixes of the non-identical actor class). The actor of the main clause is also the actor of the subordinate clause whose verb ends in -š: píš-kič ʔišt ʔapalakán pili·láš *Then-it-is said Coyote threw-it-down when-he-arrived*. Suppose the informant is asked to repeat, but with X (ʔišta accusative for *Coyote*) instead of Y (išt, nominative, as in the original utterance). This will be done, but with co-occurrence of subordinating verb ending in -n; then the accusative N, *Coyote*, is no longer the actor of the main verb but the goal of this verb and simultaneously the actor of the subordinating verb: *Then it is said, she threw Coyote down when he arrived*. What ancillary eliciting obtains for this rule is the additional fact that an accusative N need not be goal of the main clause verb—as it usually is in non-directive texts—in order to be actor of a non-identical

actor subordinating verb (which, in the following example, precedes the main clause): ko·ymí wele·hanáŋ wah ta·twál halít *while the woman* (N in accusative case) *is fishing, the man* (N in nominative case) *is just sitting there.*

With such co-occurrence and associated transposition as a traditional objective of ancillary eliciting it is theoretically expectable that a transformational grammar—transpositions derived by rule from a set of kernel sentences—can be constructed in the field work situation characteristic of anthropological linguistics—that in which a bilingual informant responds to a linguist who asks the informant to ring changes on non-directive utterances in the informant's language. However, all attempts at constructing transformational grammar, so far, have been made by linguists who have served as their own informants. The question is an open one as to whether enough transpositions can be obtained through ancillary eliciting to formulate kernel sentences, or whether a prerequisite for such formulation is great fluency in the language under investigation, with the informant serving as his own informant.[11]

A closely similar kind of arbitrariness is encountered in the construction of transformational grammars—where it is identified as 'degrees of grammaticalness'—and in ancillary eliciting where it involves informant approval of utterances made by other informants, whether the utterance under criticism is a non-directive utterance or an utterance with transposition (± contraction ± expansion) derived from a non-directive utterance by ancillary eliciting. This general problem of SELECTION involves evaluation, and hence belongs to part II of this paper.

[11] Some linguists who have experience in working with transformational grammar agree with me that the theoretical expectation is that it can be done; others think not. In defending his Ph.D. thesis (Indiana, 1959), A Generative Grammar of a Dialect of Illocano, Ernesto Andres Constantino made the point that he had to experiment with so many alternative possibilities in expression that his task was feasible only with a fluent command of Illocano; in effect, that the pace, with ancillary eliciting, would have been too slow to make the construction of a transformational grammar manageable.

HUICHOL TONE AND INTONATION

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0. Introduction
1. Phonology
2. Morphophonemics
2.1 Precontour and nucleus
2.2 Tone and intonation
2.3 Intonation morphemes
3. Text
4. Procedure

0. This paper describes the syllable, the intonational phrase, and an intermediate unit called the FOOT in Huichol phonology, and the systems of tone and intonation in Huichol morphophonemics.[1] The syllable consists of a consonantal onset and a peak, which is in turn divisible into constituents of pitch and of one or two vowels. The foot is composed of one to five syllables, one of which is stressed. The position of the stressed syllable in the foot is determined by patterns of pitch and length. The intonational phrase is composed of feet and ends in a terminal.

Morphemically significant pitch sequences occur principally on the final one or two feet of the phrase. The locus of occurrence of these pitch sequences is the phrase nucleus. Contrasts of all phonemic pitch levels occur in the nucleus; in the precontour which precedes it only limited pitch contrasts occur. The morphophonemic distinction between tone and intonation is based on this limitation in pitch distribution and on the different ways in which the pitches of the precontour and of the nucleus enter into the phonemic shapes of morphemes.

0.1 Tonal features have been reported for one dialect of Nahuatl[2] and for several

[1] Huichol is a Uto-Aztecan language spoken by about five thousand inhabitants of the states of Jalisco and Nayarit, Mexico. This paper is based on field work carried out under the auspices of the Summer Institute of Linguistics between 1952 and 1957. It was adapted for publication from a thesis of the same title presented to the graduate faculty of Cornell University in partial fulfillment of the requirements for the degree of Master of Arts. I acknowledge gratefully the help given me by Charles F. Hockett.

[2] Whorf 1946b, p. 369, cited forms distinguished only by pitch. Bibliographical references are given in full here: Bloch, Bernard and George L. Trager, 1942, Outline of Linguistic Analysis (Baltimore). Diguet, Léon, 1911, Idiome Huichol: Contribution a l'Étude des Langues Mexicaines, JSAP n.s. 8. 23–54. Grimes, Joseph E., 1953, Review of Mason 1950, IJAL 19.313–315. 1955, Style in Huichol Structure, Lg 31.31–35. 1956, Style in Huichol Structure II: Morphophonemics, ms. read to the summer meeting of the Linguistic Society of America, Ann Arbor. 1957, Longitud, Tono y Acento en el Huichol: Observaciones Preliminares, ms. read during Linguistic Week, México, D.F. Hockett, Charles F., 1955, A Manual of Phonology, IUPAL Memoir 11.55–57. Kroeber, Alfred L., 1934, Uto-Aztecan Languages of Mexico, Ibero-Americana 8 (Berkeley). Lumholtz, Carl, 1900, Symbolism of the Huichol Indians, Mem. Nat. Hist. Mus. 3 (New York). 1903, Unknown Mexico, Vol. 2 (London). Mason, J. Alden, 1918, Tepecano Prayers, IJAL 1.91–153. 1923, A Preliminary Sketch of the Yaqui Language, UCPAAE 20.195–212. 1936, The Classification of the Sonoran Languages (with an appendix by B. L. Whorf), *in* Essays in Honor of Alfred Louis Kroeber (Berkeley), 183–98. 1950, The Language of the Papago of Arizona (Philadelphia). McIntosh, John B., 1945, Huichol Phonemes, IJAL 11.31–35. McIntosh, Juan B. y José Grimes, 1954, Niuqui 'Iquisicayari: Vocabulario Huichol-Castellano Castellano-Huichol (Mexico, D.F.). Pike, Eunice V., 1951, Tonemic-Intonemic Correlation in Mazahua (Otomí), IJAL 17.37–41. Pike, Kenneth L., 1948, Tone Languages (Ann Arbor). 1955, Language in Relation to a Unified Theory of the Structure of Human Behavior, Part II (Glendale), pp. 41–70. 1957, Abdominal Pulse Types in Some Peruvian Languages, Lg 33.30–35. Pike, Kenneth L., Ralph P. Barrett, and Burt Bascom, 1958, Instrumental Collaboration on a Tepehuan (Uto-Aztecan) Pitch Problem, Studia Phonetica. Pimentel, Francisco, 1903,

Piman languages, but little has been written to explain the function of pitch in those languages.[3] Some Uto-Aztecan languages are described as having a stress accent (Voegelin 1935, Whorf 1946a, Mason 1923). Contrasts involving pitch are found in the more distantly related Tanoan languages (Trager 1942).

I have found evidence in Cora suggestive of a pitch contrast on long stressed syllables, though Preuss (1932) described only a stress accent for Cora.[4]

Comparative treatments of Uto-Aztecan have been made with little reference to accent—a pardonable deficiency in view of the data available (Sapir 1913, 1915, Kroeber 1934, Mason 1936). Sapir (1913, pp. 112–21) discussed quantity and rhythm in connection with the origin of vocalic syncope in Nahuatl. It is hoped that the present study will contribute both material and stimulus to this neglected phase of Uto-Aztecan studies.

0.2 The lists of Huichol words which appeared from time to time in the reports of travelers (Pimental 1903, Lumholtz 1900, 1903) show an occasional accent mark, which probably represents a 31 nuclear contour such as would occur with elicited responses to a word list. Diguet (1911), who recorded his material in terms of French phonology and orthography, nevertheless recognized the difference between long and short syllables.

McIntosh's article on Huichol phonemes (1945) was the first systematic description of Huichol phonology. His listing of the segmental phonemes is essentially correct; I have proposed a revision of it elsewhere (Grimes 1955). In a very real sense the present study constitutes a supplement to rather than a replacement of McIntosh's work.

According to McIntosh each occurrence of a vowel is the occurrence of a syllabic nucleus; stress is phonemic. It appears to me that this analysis is an attempt to explain such things as rising pitch glides in terms of stress, without recognition of the lack of correspondence between features of pitch and mora-length vowel segments (**1.1.1**). For example, McIntosh would analyze a form such as /ʔaa^{23}tu^{1} *the day before yesterday* as three syllables /ʔa.a.tu/ with stress on the

Cuadro descriptivo y comparativo de las Lenguas Indígenas de México, o Tratado de Filología Mexicana, *in* Obras Completas de D. Francisco Pimentel, Tomo 1 (México, D.F.), pp. 287 ff. Preuss, K. Th., 1932, Grammatik der Cora-Sprache, IJAL 7.1–84. Sapir, Edward, 1913, Southern Paiute and Nahuatl, A Study in Uto-Aztekan, Part I, JSAP n.s. 10.379–425. 1915, Part II, AA n.s. 17.98–120, 306–328. Stetson, R. H., 1951, Motor Phonetics[2] (Amsterdam). Trager, George L., 1942, The Historical Phonology of the Tiwa Languages, SIL 1, no. 5. Trubetzkoy, N. S., 1949, Principes de Phonologie, tr. J. Cantineau (Paris). Twaddell, W. Freeman, 1953, Stetson's Model and the "Suprasegmental Phonemes," Lg 29.415–453. Voegelin, Charles F., 1935, Tübatulabal Grammar, UCPAAE 34.2 Vogt, Evon Z., 1955, Some Aspects of Cora-Huichol Acculturation, América Indígena 15.249–263 (with bibliography). Whorf, Benjamin Lee, 1946a, The Hopi Language, Toreva Dialect, *in* Harry Hoijer and others, Linguistic Structures of Native America, VFPA 6.158–183. 1946b, The Milpa Alta Dialect of Aztec, with notes on the Classical and Tepoztlán Dialects, *ibid.*, 367–397.

[3] Mason (1918) wrote both stress accent and pitch accent in Tepecano. For Papago Mason (1950) reported that Herzog found pitch accent significant in Pima, and listed some Papago stems which are distinguished by pitch accent. In my review of Mason (Grimes 1953) I suggested that "it is possible here, as in Huichol, that pitch is determined by combinations of length and stress which are not immediately apparent." The statement on Huichol represents a now discarded hypothesis; and my suggestion for Papago pitch accent may well be of no more abiding relevance. Pike, Barrett, and Bascom (1958) offer instrumental evidence tending to support phonemic pitch in the Baborigame dialect of Tepehuan.

[4] On a brief trip to Cora territory in May of 1957, working with Ambrose McMahon of the Summer Institute of Linguistics, we turned up some apparent pitch differences in pairs like nú?úrí+hà?ùràa *I am on my way*, tú?úrí+hà?ùkáh *we are on our way*, in which the final syllables are stressed and are respectively low and high in pitch.

second syllable. By the analysis developed here the pairs of forms he cited to show stress contrasts actually differ by several phonemic features: tuu^{3}ka^{1} *day*, tuu^{1}+ka^{31} *spider*; ʔa^{3}ki^{1} *rib*, ʔaa^{1}kii^{31} *your house*; pʌ^{1}wa^{3}ki^{1} *dry*, pʌ^{1}waa^{1}+kii^{31} *it is their house*.

The Huichol-Spanish dictionary compiled by McIntosh and myself (1954) did not take account of pitch or of foot boundaries. An acute accent marked stress syllables, and an underline marked long vowels (now analyzed as geminate sequences).

1.1 The phonological unit in Huichol of the first size-level above that of the phoneme is the SYLLABLE. Its structure is statable in terms of sequential and simultaneous relationships between phonemes of certain classes. In external distribution the syllable functions in the foot.[5]

1.1.1 In lento (careful, precise) speech every segment which is perceived as the articulatory result of a single chest pulse consists of one of the consonant phonemes /p t k q c z r m n ʔ h w y/ as onset, followed by a peak which consists of one or two of the vowel phonemes /a e i u ʌ/ accompanied by one or two pitch phonemes.[6] Any such segment constitutes a syllable.

The vowel sequences which occur in the syllable peak are summarized by McIntosh (1945), who presents them as dissyllabic sequences. Geminate sequences of vowels are phonetically long. In nongeminate sequences the relative prominence of the members of the sequence is a function of the members themselves. In sequences which begin with /a/ or /e/, and in /ie/, the first member is more prominent: /muu^{2}wie^{3}ri^{1}/ [mu·^{2}-wi$\underset{\sim}{e}$^{3}ri^{1}] *shaman's plumes*. In /ʌi/ and /iu/ the second member is more prominent; in the latter the /u/ is noticeably longer than is the more prominent member of any other sequence: /kʌ^{1}ciu^{3}ri^{1}/ [kʌ^{1}cju·^{3}ri^{1}] *bag*.

In most positions the pitch constituent of the syllable peak represents one pole or the other of a two-way pitch contrast. However, toward the end of the intonational phrase a four-way contrast in pitch is possible. For phonemic purposes, then, pitch is transcribed everywhere in terms of the maximal (four-way) contrast. Superscript numerals ^{1} (lowest) to ^{4} (highest) are written after each syllable to indicate pitch.

The four-way contrast of pitch is illustrated on the final syllables of the following four phrases. Pitches 1, 2, 3, and 4 are shown after a pitch 3 on a stressed syllable and with a terminal fade. The pitches of other syllables in the phrases given do not affect the contrast in final position.

(1) ʔe^{3}na^{1}+pe^{1}ka^{1}niu^{2}+yei^{3}kaa^{1}+mʌ^{3}kʌ^{1}# *You are to stay here.*

(2) kee^{1}ri^{1}+tiu^{2}yuu^{2}+ni^{3}zʌ^{2}# *Where did he go?*

(3) taa^{3}hi^{3}+kai^{3}+ʔu^{3}ra^{1}+kaa^{1}kai^{3}ku^{3}# *in the afternoon when the sun was near the horizon*

(4) kee^{3}+cʌ^{3}zʌ^{4}# *What on earth!*

The pitches of all syllables except some of those which occur near the end of the intonational phrase are perceived as level throughout the syllable. When compared with a spectrographic recording of pitch[7]

[5] Stetson's description of the muscular activity in syllable production (1951), discussed by Twaddell 1953 and Pike 1955, appears to me, at least impressionistically, to fit the Huichol data.

[6] The articulatory components of consonants are bilabial, apicoalveolar, and dorsovelar points of articulation; stop, affricate, fricative, flap, nasal, and semivocalic manners of articulation; and rounding. These give bilabial, apicoalveolar, and dorsovelar stops /p t k/, dorsovelar rounded stop /q/ (=[k^{w}]), apicoalveolar affricate, fricative, and flap /c z r/ (the latter two with retroflex quality), bilabial and nonlabial /m n/ (the latter dorsovelar before /k q/, apicoalveolar elsewhere), positionless (i.e. non-oral) /ʔ h/, bilabial and apicoalveolar semivowels /w y/. The articulatory components of vowels are high and low tongue height, front and back tongue position, and rounding. These give low back /a/, low front /e/, high front /i/, high back /ʌ/, and high back rounded /u/.

[7] Narrow-band spectrograms of a magnetic tape recording of Huichol text material were made during the 1953 session of the Linguistic Institute at Indiana University, as part of class work under

the perceived pitch level corresponds more or less to the reversal point of a rising-falling or falling-rising pitch line within a syllable, or if a syllable contains no reversal point, to the height of the pitch line at the end of the syllable.

Glides from one phonemic level to another occur occasionally on stressed syllables near the end of the intonational phrase. Glides with beginning and ending points 41, 31, 32, 23, 21, and 12 have been noted.

The number of pitches (one or two) which occur on a single syllable bears no consistent relationship to the number of vowels (one or two) in the syllable peak. For this reason pitch is analyzed as an immediate constituent of the syllable peak as a whole rather than of mora-length segments of the peak.

The phonetic spread of pitches in the narrative style on which this paper is based varies from two or three semitones in the early part of the phrase to seven or eight semitones at its end. The reference point for describing the phonetics of pitch is pitch 3. The highest pitch level which occurs in the early part of the intonational phrase is pitch 3.[8]

Pitch 4, which occurs only near the end of the phrase and there only rarely, is one or two semitones higher than pitch 3: kee^{3}+cʌ^{3}zʌ^{4}# *What on earth!*

Pitch 2 is one or two semitones below pitch 3: kee^{1}ri^{3}+nuu^{3}+nuu^{3}ci^{1}+kaa^{1}+peu^{3}ku^{2} . . . *What! The baby went to sleep? (with an air of exasperated relief)*

Pitch 1 is three semitones or more below pitch 3. In general, allophones of pitch 1 which are three and four semitones below pitch 3 occur with the terminal sustain or phrase medially, while lower allophones occur with the terminal fade. In a sequence of pitch 1 syllables the first tends to be slightly higher than the ones following it.

In non-lento (normal and rapid-fire) speech most syllables are of the same form as those of lento speech. However, in keeping with the different morphophonemic patterns which identify non-lento speech, clusters of two consonants occur (Grimes 1956). Phrase initially and after a phrase-medial juncture (**1.3.2**) /pt mp mt mn/ may occur. These clusters function as compound onsets of the first syllable after the juncture: ta^{1}he^{1}paʌc^{3}ta^{1} | pti^{3}+ku^{1}zaa^{3}ta^{1}# *He is talking about us.*

When not initial or preceded by phrase-medial juncture the sequences /pt pk pc pn ct ck zt mp mt mk mq mc mn mw my nt nk nq nc ny/[9] occur, the first member of each sequence as the coda of one syllable and the second member as the onset of the next. These sequences of consonants occur regardless of whether the syllables are in the same foot or not.

It is possible that the phrase-initial occurrence of compound syllable onsets establishes a pattern on the basis of which all consonant sequences should be considered compound syllable onsets. However, syllable boundaries and at times foot boundaries are clearly identifiable in many utterances in the middle of consonant sequences of the second list. The phrase-medial juncture is a convenient device for distinguishing compound onsets from such medial sequences. McIntosh (1945) offers a somewhat different interpretation of compound onsets based partly on informants who do not all use the same clusters as my informants, and partly on a difference in frame of reference.

The /m/ of mpaʌ *thus* constitutes an entire syllable when it occurs stressed according to the regular patterns of stress (**1.2**). In

Martin Joos. The fundamental frequency of the voice was displayed against time, using a logarithmic scale for frequency in order to show comparable auditory intervals in different parts of the voice range in comparable dimensions.

[8] Phrases occur in which there is a downward drift of pitch over the whole phrase. This drift does not appear to belong to the same portion of the linguistic code as that under discussion. Its rate of drop, though different from phrase to phrase, is constant throughout a phrase; so there is little difficulty in establishing pitch level 3 even in phrases of this type.

[9] When followed by a consonant /c/ is phonetically [s] rather than [ts].

the examples a raised tick is written before (nonphonemically) stressed syllables: ˈm³-paʌ¹, ˈm³paʌ³, ˈm²paʌ³ *thus*. When the /m/ of mpaʌ *thus* is not stressed I treat the sequence /mp/ like any other compound syllable onset and write no pitch phoneme on the /m/: mpaʌ³¹ *thus*.

1.1.2 In order to describe the structure of the foot, syllables are classified by pitch and length. A syllable has the pitch of the highest pitch phoneme of its peak. A syllable is SHORT if its peak contains only one vowel with no coda, and LONG if it has a coda, a peak of two vowels, or both.

1.2 The phonological unit of the first size-level above that of the syllable is the FOOT. The foot is a sequence of one or more syllables with phonological boundaries; one of the syllables is stressed.[10] The foot functions in the intonational phrase. The rhythmic patterns of phrases are explained in terms of feet, as in the following near-minimal pair of examples, in which /+/ indicates a medial foot boundary: ʔaa³+yee¹taa³¹# *just above the letter "a"*, ʔa³yee¹+taa³¹# *a turtle also*.

Phrase-medial boundaries between feet are generally perceptible. They are characterized by transition phenomena of an open sort: slight drawling before the boundary, and slightly delayed release of the consonant after the boundary, but without special features of pitch or muscular tension.[11]

The position of the stressed syllable of the foot is wholly predictable, given the foot boundaries and the pitches and lengths of the syllables. In most cases the position of the stressed syllable between boundaries can be stated entirely in terms of pitch sequences; however, there are some pitch sequences for which the position of the peak depends upon the lengths.

The position of the stressed syllable in feet of different pitch and length configurations is given in the form of a set of rules. The rules are in an ordered sequence, so that Rule 2 applies only if Rule 1 does not, and so on. In the examples, feet other than those which illustrate the rule to which the examples are appended are enclosed in square brackets.

Rule 1. If the pitch in a foot drops, the last syllable with the higher pitch is stressed: ˈha³ke² . . *Where?* (*incredulously*), yʌʌ³-ˈwi³pa¹ *in the dark*, [ˈnaa¹+kaˈ¹we²]+ˈqi³-tee¹mʌʌ¹+[ˈzʌʌ²]+ˈme³ya¹ *species of tuber*.

Rule 2. If the pitch rises from pitch 1, and if the first syllable is long and succeeding syllables are short, the first syllable is stressed: ˈteʌ¹teˈri²+[ˈyaa³ri¹] *type of people*, ˈhaa¹ku³+ˈnai¹ka²+[ˈya³ri¹] *bamboo roofing needle*.

Rule 3. If the pitch rises from pitch 1, the first syllable of higher pitch is stressed: tee¹ˈpʌʌ³ *flea*, kaˈ¹kai³ku³ *when it was down there*.

Rule 4. If the pitch is level, or if it rises from pitch 2, and if the first syllable begins with /ʔ/, is short, and is followed by a long syllable, the second syllable is stressed: ʔu³ˈtai³ *giant woodpecker*, ʔiˈ¹wie¹+[ˈyaa³me¹] *swallow*.

Rule 5. The first syllable is stressed: ˈci¹+[ˈmua³ka¹] *red squirrel*, ˈzʌ¹ka¹ *if*, ˈta³ciu³ *rabbit*, ˈyʌʌ¹zʌʌ¹naa¹+[ˈwee³ka¹] *having got himself loose*.

1.3 The largest size-level with which it is necessary to deal in Huichol phonology is that of the INTONATIONAL PHRASE, or simply the PHRASE.[12] Longer stretches of speech are

[10] Compare the descriptions of the foot (stress group, abdominal pulse, abdomineme) in Stetson (1951), Twaddell (1953), and Pike (1955, 1957). Stressed syllable and foot boundary have functions which correspond respectively to Trubetzkoy's fonction culminative and fonction délimitative (Trubetzkoy 1949, pp. 31–32). I here regard the foot as a phonological unit of which stressed syllable and boundaries are features, following Pike (1955, pp. 63–66).

[11] Compare the phonetic description of plus juncture in English given by Twaddell (1953, §44).

[12] It should be emphasized here that 'phrase' is used not as a grammatical term, but to identify a particular phenomenon in phonology.

adequately described as strings of phrases. An intonational phrase is defined as the speech activity which takes place between terminals (**1.3.1**). Some phrases are followed by pause, and some are not.

Each phrase consists of at least one foot, which in turn consists of at least one syllable. If a phrase consists of a single syllable, that syllable is long and without coda: qai^{31}# *Wow!*

1.3.1 The three patterns of phrase termination which are in contrast before pause are:

/#/ FADE, a fairly rapid attenuation of the last syllable, which may trail off into weak laryngealization. When the last syllable before the fade is on pitch 1 its phonetic level of pitch may glide downward during the syllable.

/.../ SUSTAIN, maintenance of the general level of intensity of vocalization throughout the last syllable with a perceptible retardation of the rate of utterance.

/!/ ABRUPT, glottalic cutoff of vocalization followed at times by a weakly breathed rearticulation of the same quality as the preceding vowel.

In each of the following phrases taken from a text the last two syllables are on pitches 3 and 2 respectively, and the stress is therefore on the penultimate syllable. The final portions contrast in their terminals.

(1) niu^{1}ti^{3}+wai^{1}ka^{1}+tʌ^{3}yaa^{1}+nii^{3}ri^{2}# *He began to play.*

(2) keem^{1}+tiu^{3}yuu^{3}+ni^{3}zʌ^{2} . . . *Where did he go?*

(3) hee^{1}cie^{3}na^{1} | ptii^{2}ti^{2}+maa^{2}kee^{3}kai^{2}! *He was climbing all over her.*

Between pauses two patterns which are phonetically similar to two of the prepausal patterns of termination are found. The first consists of a fairly rapid attenuation of a syllable which may trail off into weak laryngealization; the attenuated syllable is followed by a surge in intensity and at times by a change of key for the pitches. The second pattern consists of the maintenance of the general level of intensity of vocalization with a perceptible retardation of the rate of utterance of a syllable; the retarded syllable is followed by a light surge in intensity. These two patterns of transition are in complementary distribution with the terminal fade and sustain which occur before pause, and are phonemically identified with them. Pause as a separate phenomenon which may or may not occur with the terminal fade and sustain is symbolized by a rest sign /℅/. The abrupt terminal occurs only before pause.

In the following examples the first contains a medial fade, the second a medial sustain:

(1) ma^{3}na^{1}pai^{1}+nee^{2}ku^{3}wie^{1}ni^{1}ri^{1}+ki^{1}ru^{2}+ʔaa^{2}+pai^{3}tʌ^{1}#ma^{3}na^{1}+nii^{3}yee^{1}+wie^{3}ni^{1}ri^{1}#℅ *She tied him up at Quiru'a; it was there that she tied him.*

(2) ʔu^{1}wa^{1}+pe^{1}nee^{3}+wai^{1}ka^{2}+nee^{3}ni^{3} . . . ne^{1}ʔi^{1}ca^{2}ri^{3}+ʔa^{1}za^{1}+pe^{1}kan^{1}ku^{1}+yu^{1}ruu^{3}+waa^{12}ni^{2} . . . ℅ *You play here; you're messing up my weaving.*

1.3.2 Medially in phrases two patterns of transition occur which are similar to patterns of transition from pause to phrase beginning. The patterns involve checked syllables and compound syllable onsets.

A stressed short syllable in phrase initial position is phonetically checked by the early closure of the onset consonant of the following syllable unless that consonant is /r ʔ h/. This checking takes place whether the first syllable constitutes a foot by itself or not: qi^{3}zʌ^{1} [ˈkᵘiz^{3}zʌ^{1}] *red-tailed hawk*, ʔa^{1}+tee^{3} [ˈʔat^{1}+ˈtee^{3}] *louse.*

Medially in the phrase following foot boundaries checked short stressed syllables may occur in contrast with unchecked short stressed syllables. Note the form ha^{3}tʌa^{1} *river* in the following examples: te^{1}nii^{3}+zei^{3}ya^{1}+ha^{3}tʌa^{1}# ([ˈhat^{3}tʌa^{1}]) *We saw the river,* ta^{3}me^{1}ri^{1}+ha^{3}tʌa^{1}pai^{1}tʌ^{1}+te^{1}pee^{3}ku^{1}+yei^{2}zʌa^{1}# ([ˈha^{3}tʌa^{1}]) *We went to the river and back.*

The medial occurrence of checked syllables is interpreted as the occurrence of a phrase-initial-like transition. This transition

is called PHRASE-MEDIAL JUNCTURE and is indicated by a vertical bar /|/ written in place of a foot boundary symbol: te¹nii³+zei³ya¹ | ha³tʌa¹# *We saw the river.*

Checked syllables could alternatively be said to contain the coda of a geminate coda-onset sequence. However, such an analysis would complicate the morphophonemics unduly in that every morpheme which begins with a short syllable would have two variants, one with a geminate sequence and one without (e.g. hat³tʌa¹∼ha³tʌa¹ *river*), whereas by the analysis in terms of phrase-media juncture such morphemes would have only one form (e.g. ha³tʌa¹), and the phrase-medial juncture would turn out to occur only at the beginning of some morphological words.

A second pattern has a distribution analogous to that of checked syllables, and is therefore also considered to involve phrase-medial juncture. Syllables with compound onsets occur initially in phrases: ptii¹+kʌ¹hʌa¹+wi³zʌ¹ . . . *he said to him.* Syllables with compound onsets may also occur medially in a phrase following foot boundaries, in contrast with coda-onset sequences of the same phonemes: kee¹ri²+mtiu²yuu²+ni³zʌ² . . . *Where did he go?* (+mt), kem¹+tii³+kʌ¹hʌa¹+wee³kai¹# *as he had told him* (m+t). The medial occurrence of compound onsets is tentatively interpreted as marking the occurrence of phrase-medial juncture: kee¹ri² | mtiu²yuu²+ni³zʌ² . . . *Where did he go?* However, it is possible to distinguish compound syllable onsets from coda-onset sequences in medial position solely by their position with respect to foot boundaries.

1.3.3 Some stressed syllables in the phrase are louder (or more forcefully uttered) than others. In general, long syllables are perceived as louder than short syllables, high pitch as louder than low, and low vowels as louder than high vowels.

Beyond the limits of these conditioned variations in loudness there is a contrast of stress levels. In some phrases the range of loudness of stressed syllables is wholly conditioned in the manner described; but there are phrases in which one stressed syllable, usually one in the early part of the phrase, is louder than it would be purely on the basis of local conditioning. This contrastive LOUD STRESS is indicated in transcription by a degree sign /°/ written before the loud stressed syllable: ʔʌ¹raa³we¹+ka³mʌ³+maa³na¹# *Look! There's a wolf!*, ʔʌ¹°raa³we¹+ka³mʌ³+maa³na¹# *Look! It's a wolf that's over there!*

2. In this section morphologically conditioned limitations on pitch distribution are described. A notation is developed which highlights the morphophonemic systems of tone and intonation. The intonation morphemes which have been identified are listed.

2.1 Morphemically significant pitch sequences are found at the end of phrases. The locus of morphemically significant pitch sequences is the PHRASE NUCLEUS, which begins with the stressed syllable of one of the last two feet in the phrase and ends at the terminal. Which of the last two feet the nucleus begins on is not statable phonologically, but is morphemically significant; its significance is a matter of which non-intonotional morpheme in a phrase the intonation is associated with.

In the following pair of utterances, the nucleus of the first begins with the stressed syllable of the last foot, while the nucleus of the second begins with the stressed syllable of the next to last foot. In both cases the nucleus begins on the word wa¹ruu²+cie³ya¹ *his mother.* For purposes of clarity the beginning of the nucleus is marked with a raised ˣ.

(1) yu²ʔi³ca²ri²+naa²ku²+wie³ni¹+wa¹ruu²+ˣcie³ya¹# *His mother rolled up her loom.*

(2) kaa¹ti¹nii³+ʔuu¹zi¹+maa²yaa²+cii³rie¹+kai²tʌ²ni²+cie³tʌ¹+mʌ³kʌ¹+wa¹ruu²+ˣ'cie³ya¹+mʌʌ¹kʌ¹# *That mother of his went on doing work for him.*

In the nucleus one, two, or three levels of pitch occur in sequence. The first pitch

begins on the first syllable of the nucleus and continues to the terminal unless a second pitch follows: ˣti³zaʌ³# *No?* The second pitch, if any, follows the first either on the first syllable of the nucleus (thus forming a glide) or on the second syllable; it continues to the terminal unless a third pitch follows: ˣti³¹zaʌ¹# *No! (you can't really mean it)*, ˣti³z̄aʌ¹+niu¹# *No, he says.* The third pitch, if any, may be of the same level as the first; it follows the second on the syllable after the one on which the second begins and continues to the terminal: ˣti³zaʌ¹+cʌ²zi²# *No. . . .*

The pitch pattern of the nucleus, abstracted from segmental and junctural material, constitutes the NUCLEAR CONTOUR. One to three numerals are used to represent the first, second, and third pitches of the nucleus; an overline indicates a glide. The nuclear contours of the examples in the preceding paragraph are 3, $\overline{31}$, 31, and 312 respectively.

In the PRECONTOUR, which comprises all the phrase except the nucleus, pitch 4 does not occur and pitches 2 and 3 are in complementary distribution, in contradistinction to the nucleus in which all pitch levels are in contrast.

Phrase precontours are of two morphemically distinct types according to the pitch sequences which occur in them. In the first type, the FLAT precontour, all pitches are either 1 or 3. In the second type, the STEPPED precontour, pitches 1, 2, and 3 occur, but 2 and 3 are in complementary distribution. 2 is followed only by 2 or 3 (including a 2 or 3 at the beginning of a nucleus), never by 1. Every sequence of one or more 2's ends with a 3. If the pitch 3 syllable which ends a sequence of 2's is stressed and is the penultimate syllable of a foot, it may be followed by one 3 or by a 1. Otherwise every pitch 3 is followed by a 1.

Because pitches 2 and 3 are in complementary distribution and 4 never occurs in the precontour, it is necessary to indicate only two pitch levels, high (ˊ) and low (unmarked), for the precontour. In the flat precontour pitch 1 is low and 3 high. In the stepped precontour 1 is low and 2 and 3 high; the last high of a sequence is pitch 3 and all highs preceding it are 2's, except that the next to the last high of a series is also pitch 3 if it is penultimate in a foot and is stressed.

Once the beginning point of the nucleus is determined morphemically, pitch is written morphophonemically for convenience. Superscript numerals are written for pitch after the first one to three syllables of the nucleus, and high and low pitches are written on the precontour. A wedge accent (ˇ) written in place of the first high pitch mark in a phrase indicates both high pitch and stepped precontour.

2.2 In the precontour, high and low pitch combine with segmental phonemes to represent morphemes. On the other hand, precontour type, loud stress, pitches of the nuclear contour, and terminal combine with each other to represent morphemes which enter first into construction with each other. For example, the morpheme {yaawi} *coyote* is formed from consonants, vowels, and (low) pitches, whereas the morpheme {ˇ32} *the speaker is exasperated* is formed wholly from the stepped precontour and the 32 nuclear contour, and enters immediately into constructions with morphemes such as *finality*. (Braces enclose cited morphemes.)

The morphophonemic system in which high and low pitch occur, combining with segmental phonemes to represent morphemes, is the TONAL system. The system in which precontour type, loud stress, nuclear contour, and terminal represent morphemes which combine with each other is the INTONATIONAL system. Tones of the tonal system are associated with individual syllables, while constructions of morphemes in the intonational system are associated with whole phrases.[13] The simplest descrip-

[13] It is possible that an analogous relationship between tone and intonation may exist in Maza-

tion of the phonemic shapes of morphemes in Huichol is the one made by distinguishing intonational features from tonal ones.

When the intonation is abstracted from a phrase, as for purposes of grammatical analysis, what was formerly the precontour retains its tonal contrasts, but what was formerly the nucleus lack tonal contrasts. In order to be able to study phrases minus their intonation I suggest imputing to the morphemes of the nucleus the tones which they would have if they occurred in a precontour. For example, yaa⁴wi¹# *A coyote!* can be analyzed into toneless yaawi *coyote*, nuclear contour 41, and terminal fade. The toneless form is given by imputation the low-low tonal sequence which that morpheme has in precontour position, as in yaawi+kámá+maa³na¹# *Look! There's a coyote!*

2.3 In this section the intonation morphemes which have been identified are set down with tentative glosses.

In most cases precontour type, loud stress, nuclear contour, and terminal appear to represent independent morphemic units which occur in syntactic relationships in intonation. In at least one morpheme, {˅32} *the speaker is exasperated*, precontour type and nuclear contour combine to form a single morpheme.

2.3.1 The flat precontour represents a morpheme of insignificant semantic content. Where a noticeable increment of meaning can be attributed to the stepped precontour as over against the flat precontour, it appears to indicate a certain degree of emotional involvement or even aggressiveness on the part of the speaker, or an emphasis on his utterance: ʔuu+cĭi+zéikáa+pée+zʌ́ʌtáatʌ+zei+kʌa³¹# *You're just using up pitch pine!* (*accusingly*)

2.3.2 Loud stress represents a morpheme which calls attention to non-intonational morphemes which occur too early in the phrasal sequence to fall within the nuclear contour. Inasmuch as loud stress occurs phonemically only on syllables which by the regular rules of stress would be stressed, it can only single out morphemes in the precontour which contain stressed syllables: neʔicárí+ ʔaza+ pepʌkúu+yuu+°rúwa+ tinii+kʌʌhʌawee+kai³tʌ¹ni# *"You're messing up my weaving!" she said to him.* ({°} calls attention to *you are messing up.*)

2.3.3 The greatest elaboration of intonation is that expressed by the pitch sequences of the nuclear contour. One pattern of automatic morphophonemic alternation is characteristic of nuclear contour morphemes: When a nuclear contour of two or three pitches occurs with a nucleus in which there is one syllable less than there are pitches in the contour, the first two pitches form a glide. This pattern of alternation results in a loss of contrast between {31} and {$\overline{31}$} on monosyllabic nuclei. Nuclear contour morphemes are:

{4} *the speaker is asking for instructions.* ʔari⁴# *Now?*

{3} *the phrase is one of a series.* warŭu+ cíeyaa+rii³# *his mother* (followed by a phrase containing the predicate of which this is the subject).

{2} *hesitation or interruption.* tinii+kʌʌ²-hʌa . . . *he said to him* (broken off; the word normally contains two or four syllables more). *Quotation*; many occurrences of the quotative forms niu, waaniu, zee+niu take {2}. ʔizʌa+ráarí+ máa+tínéi+káakai+ niu² . . . *A ceremony, so the story goes, was to take place. Introduction of an episode*; the initial phrases of some texts, and some phrases which introduce important parts of narrations, take {2}. měrí+kʌʌ²cʌʌ . . . *paragraph introducer. List* the items of which follow each other in rapid order (compare {31}). ʔáru+ri² . . . páatu+ri² . . . *a turkey, a duck . . .*

{1} *afterthought*; a nonemphatic word added at the end of a sentence is marked as an afterthought by {1}. tŭu+kárii+kapíi+

hua (Eunice V. Pike 1951). In Mazahua intonation may be associated with foot-like units rather than with larger units as in Huichol.

píitʌakaikʌ+mʌ́ʌ¹kʌ# *He didn't allow her, any time, that one* (mʌ́ʌkʌ) *didn't.*

Nuclear contours of two pitches which end on pitch 1 generally signal the end of a syntactic grouping of some kind, not necessarily of the largest size-level.

{41} *attention is called to the morpheme on which the nucleus begins,* with greater intensity than is conveyed by {31}. ma⁴na¹# *There! (I have pointed it out to you five times already.)*

{31} *slight attention is called to the morpheme on which the nucleus begins.* This meaning is most apparent when the nucleus begins on the penultimate foot of a phrase. Grammatical phrases and sentences frequently end with {31}. Lists are given with {31} if the items do not follow each other in rapid order. wé?uti+tee³tʌ¹+waniu# *while they were there, as the story goes* (with focus on *were* rather than on the quotative which makes up the final foot).

{3̄1} *encouragement* or *enthusiasm,* or *disparagement.* maa³¹na# *There it is! (I'm glad you found it.)*

{2̄1} This morpheme occurs only once in the material examined. Its meaning is not clear. niutl+waikaa+tʌ́yaa+nii²¹# *He began to play.*

{ˇ32} *the speaker is exasperated*; this morpheme includes the stepped precontour and contrasts with {32} except on phrases too short to contain a precontour. keerl+tíuyúu-+ni³zʌ²# *Where on earth did he go?*

{32} the phrase on which {32} occurs is frequently tied grammatically to the following phrase. ráa+?éeri+wátʌ+zei+kʌ́ari+ma³na² . . . *as she just thought it over at that place . . .*

{23 ~ 12} *emphasis.* This morpheme is both phonemically and semantically similar to the stepped precontour morpheme, in which 23 pitch sequences are characteristic. 23 occurs on morphemes which would have an imputed high tone (**2.2**) on the syllable on which the nucleus begins if the intonation were removed. 12 occurs on morphemes which under the same circumstances would have an imputed low tone. takăi+meta+tá mpáʌ+kayʌ́ane+?aa²³tu . . . *He was probably doing that yesterday, and the day before as well.* (Compare imputed ?áatu *the day before yesterday.*) ne?icárí+?aza+pekanku+yurúu+waa¹²ni . . . *You keep messing up my weaving.* (Compare imputed pekanku+yurúu+waani *you keep doing it.*)

{34} *emphasis.* kée+cʌ³zʌ⁴# *What?*

{24} *mild emphasis,* sometimes also *puzzlement.* mána+nʌʌ²rʌ⁴# *There? (I still don't understand.)*

Four nuclear contours of three pitches occur. Three of these are evidently composed of two morphemes in sequence.

{31} + {2} *attention is called to a word in the introduction of an episode.* mĕrí+kʌʌcta+huutaa+rie³ka¹ri² . . . *Well, the second time . . .*

{31} + {3} *attention is called to one phrase of a series.* hii+kʌ̆+múkáa+táari³zʌ¹+rii³ . . . *then when it dawned.*

{32} + {3} *the phrase is tied grammatically to the next phrase of a series* (?). mănа+?ukaitʌ+náayaa³²ni³# *He took up living there.*

{2̄31} *pique,* in both jocular and bitter moods. This contour is probably not a sequence of {2̄3} + {1}. haa²³ke¹# *Where? (I think you're kidding me.)*

2.3.4 The terminals represent one morpheme each:

{#} *finality, definiteness.* ?uukĭi+tʌ³tʌ¹# *who was a male* (final phrase in a grammatical sentence).

{. . .} *continuation.* mʌ́yáarí+?úyʌʌ³ku¹ . . . *when she had done that* (first part of a grammatical sentence)

{!} *forcefulness.* hutăa+ríeka+tá mána+pairéiku+tua³ni¹! *She hauled him back there a second time (said emphatically).*

3. The following text, a brief excerpt from a narrative recorded on magnetic tape by Higinio Muñoz, illustrates the occurrence of some of the intonation morphemes. After each grammatical sentence phrase-by-phrase English translation is given in small

caps, with an explication of the intonation in parentheses. Morphological words in Huichol are indexed by means of subscript numerals at the beginning of each word, to which are matched numerals at the beginning of corresponding English words.

$_{1}$měrí+$_{1}$kʌʌ^{2}cʌʌ . . .↘ $_{2}$ʔukarící+$_{3}$níu+tíni+we^{3}ni#↘ $_{1}$WELL, ({˅} *attention-getter*, {2} *introductory*, {. . .} *continuation*) $_{2}$AN $_{2}$OLD $_{2}$WOMAN $_{3}$GAVE $_{3}$BIRTH. ({3} *clause is member of a series*, {#} *end of clause*).

$_{1}$mana+$_{2}$ʔuyei+ka^{3}tʌ#↘ $_{3}$nŭnúuci+$_{4}$níutí+nui^{3}wa^{1} . . .↘ $_{5}$ʔukíi+tʌ^{3}tʌ^{1} . . .↘ $_{2}$WHILE $_{2}$IT $_{2}$[the child] $_{2}$WAS $_{1}$THERE ({3} *clause is member of a series*, {#} *end of clause*) THE $_{3}$CHILD $_{4}$WAS $_{4}$BORN, ({˅} *emphasis on the clause as a whole*, {31} *focus on "was born,"* {. . .} *continuation of sentence*) A $_{5}$MALE. ({31} *focus on last phrase of sentence*, {. . .} *transition to next sentence*).

$_{1}$máyáarí+ $_{2}$ʔuyʌʌ^{3}ku^{1} . . .↘ $_{3}$mána+$_{4}$ʔukaitʌ+ $_{5}$náayaa^{31}ni^{3}#↘ $_{2}$AFTER $_{1}$THAT $_{2}$HAPPENED ({31} *focus on "happened,"* {. . .} *continuation of sentence*) $_{5}$HE $_{5}$TOOK $_{5}$UP $_{4}$LIVING $_{3}$THERE. ({31} *focus on "took up,"* {3} *foreshadowing of next sentence*, {#} *end of sentence*).

$_{1}$niuti+waikaa+táyaa+nii^{21}ri#↘ $_{1}$HE $_{1}$BEGAN $_{1}$TO $_{1}$PLAY. ({2̄1} meaning unknown, {#} *end of clause*).

$_{1}$yuwai+kárí+ $_{2}$mʌree+ti^{3}ma . . .↘ $_{2}$HE $_{2}$GOT $_{2}$TO $_{2}$KNOW $_{1}$HIS $_{1}$OWN $_{1}$TOYS. ({3} *clause is member of a series*, {. . .} *leading to next sentence*).

$_{1}$warúu+cíeyaa+rii^{3}# $_{2}$mérí+kʌ́ʌcʌ́ʌ+$_{3}$nîi+ $_{4}$tínîi^{2}îicaa+kai^{4}tʌ^{1}ni . . .↘ $_{1}$HIS $_{1}$MOTHER, ({˅} *emphasis on phrase*, {3} *first phrase of a series*, {#} *end of syntactic unit*) $_{2}$WELL $_{2}$[marker of paragraph which begins with "his mother"], $_{3}$SHE— $_{3}$[hesitation form] $_{4}$SHE $_{4}$WAS $_{4}$WEAVING. ({41} *important point*, {. . .} *leading to next sentence*).

$_{1}$mána+ $_{2}$ʔuyei+ka^{3}tʌ#↘ $_{3}$hee+pǎna+$_{4}$néyéikaa+káitʌ^{3}ni^{1}#↘ $_{2}$WHILE $_{2}$HE $_{2}$WAS $_{1}$THERE ({3} *clause is member of a series*, {#} *end of clause*) $_{4}$HE $_{4}$WALKED $_{3}$TOWARD $_{3}$HER ({˅} *generally more intense feeling tone on this and following sentences*, {31} *focus on "he walked,"* {#} *end of sentence*).

$_{1}$warŭu+cíeya+ $_{2}$mpáʌ+ $_{3}$tinii+kʌhʌawee+kai^{3}tʌ^{1}ni . . . $_{4}$ʔuma+pái+ $_{5}$keneu+yéikaani+ $_{6}$neʔicárí+ $_{7}$ʔaza+ $_{8}$pepkúyúu+ $_{9}$rúwa+ $_{9}$tínii+kʌhʌawee+kai^{3}tʌ^{1}ni#↘ $_{1}$HIS $_{1}$MOTHER $_{3}$SAID $_{3}$TO $_{3}$HIM $_{2}$(THUS), ({31} *focus on "said,"* {. . .} *leading to quotation*) $_{5}$"STAY $_{4}$OVER $_{4}$THERE; $_{8}$YOU'RE $_{7\text{-}8}$MESSING $_{7\text{-}8}$UP $_{6}$MY $_{6}$WEAVING," $_{9}$SHE $_{9}$SAID $_{9}$TO $_{9}$HIM. ({°} *focus on "messing up,"* {31} *focus on "said," end of sentence*).

$_{1}$tĭzʌ́ʌ+ $_{2}$kati^{2}ée+náká+ $_{3}$ʔutaacuatʌ+$_{4}$mána+pee $_{5}$heecíena| $_{6}$ptiiti+máa+kee^{3}-kai^{1}!↘ $_{1\text{-}2}$NOT $_{2}$OBEYING, ONLY $_{3}$CRYING, $_{6}$HE $_{6}$CLIMBED ALL $_{5}$OVER $_{5}$HER $_{4}$THERE. ({31} *focus on "climbed,"* {!} *forceful statement*).

4. In this section some of the procedures used to arrive at this analysis are described.

4.1 I began the analysis of suprasegmental features in Huichol by recording substitution items in frames by Pike's technique (Pike 1948, 48–67). Data were recorded at first in the light of a hunch that stress might be phonemically significant. Inasmuch as lists are generally given in Huichol with what I now analyze as a 31 nuclear contour for each item, that contour gave the effect of a phonemic stress occurring on one of the final three syllables of a form: nepíi+zéiya+taakʌʌ^{31}# *I see a palm tree* (last syllable), nepíi+zéiya+cʌʌ^{3}kʌ^{1}# *I see a dog* (next to last syllable), nepíi+zéiya+cii+qi^{3}-zʌ^{1}ka# *I see a shaman* (second from last syllable). This apparent stress contrast did not explain suprasegmental phenomena fully, but was adopted tentatively under pressure of other work.

Toward the end of the field work period a number of hypotheses concerning suprasegmental features were formulated, based on the combinations of those features which might turn up in the language. Each hypothesis in turn was tested for a period of time by taking down data from conversation according to the hypothetical scheme. The

hypotheses actually tested in this way were: (1) short and long vowels, loud and weak stress are phonemically distinct; (2) short and long vowels, loud, medial, and weak stress are distinct; (3) short and long vowels, loud and weak stress, high and low pitch are distinct; (4) short and long vowels, high and low pitch are distinct.

Hypothesis 3 resulted in a more satisfactory recording of data than had any previous scheme. Hypothesis 4, which omitted stress, seemed equally appropriate.

At this point other hypotheses which had been set up for testing were set aside in favor of a fresh examination of substitution items in frames. This time special attention was paid to features of length and pitch as suggested by Hypothesis 4. When substitution items in the precontour position were examined the pitch and length contrasts showed up clearly, and examination of the data which had led me to regard stress as phonemic in Huichol showed that the pitch-length hypothesis served as well to explain residual problems.

In a preliminary report (Grimes 1957) I pointed out some of the phonemic contrasts involving pitch and length and stated that accent was describable in terms of length and pitch sequences. Further analysis of the material on tapes convinced me of the necessity of including foot boundaries in the analysis as well.

The final classification of the material in frames was made on edge-punched index cards. The cards showed whether each syllable of a form was long or short, high or low, stressed or unstressed, and preceded by a foot boundary or not. The manipulability of this indexing system made it possible to examine relationships between these four factors with ease. Conclusions on stress distribution arising from this examination of the indexed data were rechecked against tape recorded text material, and minor revisions were made.

4.2 For the analysis of intonation a text recorded on tape by Higinio Muñoz (an excerpt from which appears in **3**) was chosen because of its relative clarity. An initial transcription was made of the segmental phonemes, high and low pitch contrasts of the type discoverable in frames, foot boundaries, pause, and breath intake. Against this transcription I made an impressionistic record of the pitch sequences which as a fairly fluent speaker of the language I reacted to as intonational. Those sequences which I thought similar to each other in pitch pattern were collated with each other by dubbing the phrases in which they occurred onto a second magnetic tape in sequence. This preliminary collation of like pitch patterns suggested the possibility of fixing on the high pitch of the precontour (pitch 3) as a reference point for describing other pitch levels, and helped clarify the identification of the nuclear contour beginning point. It also pointed up certain insufficiencies in my hearing of pitch patterns.

On succeeding collations my attention turned to overall pitch patterns in the phrase, first through examination of spectrographically analyzed pitch from some text material,[14] second through a rough transcription of the pitch of successive syllable of a phrase on a musical score, using a tuning fork as pitch reference. A portion of the text was next retranscribed with the aid of the tuning fork.[15] Pitches of the nuclear contours of phrases were recorded as on the reference, or as above or below it by a specified number of semitones. A dubbed collation of like pitch patterns based on this transcription yielded results which agreed substantially with my own reactions to Huichol intonational patterns. With a little revision based on spot checks of other texts from the same and other informants the results of this final collation led directly to the description given in this paper.

[14] See fn. 7.

[15] It is not entirely facetious to suggest that a tuning fork or pitch pipe be placed in the linguist's armamentarium along with the small mirror and pocket flashlight specified by Bloch and Trager (1942, p. 13).

COMPARATIVE MONO-KAWAIISU[1]

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1. Introduction
2. Phonemic systems
3. Correspondences
4. Mono-Kawaiisu comparative vocabulary
5. Index

1. Mono, or Monachi, is a member of the Mono-Paviotso branch of the Numic family of Utaztekan. Kawaiisu is a member of the Kawaiisu-Ute branch of the same family.[2]

The glottochronological time depth between Mono and Kawaiisu (using the 100 word list) is approximately 1800–2200 years, depending upon one's imagination in the perception of cognates.[3] Southern Paiute and Kawaiisu are either dialects of the same language or else very closely related languages.

While a Proto-Mono-Kawaiisu language never existed, its hypothetical phonemic system, except for certain nasals, resembles that of Proto-Numic. Nevertheless, this is a preliminary statement. Various morphological and other factors which seem to have been present in Proto-Numic and at later stages have not been isolated; consequently some of the apparent phonemic correspondences involving stops and /w/ will very likely be subject to revision when further comparative work on Numic languages is undertaken. This is especially true because there is a third, coordinate branch of Numic—Panamint-Shoshone, and because neither Mono nor Kawaiisu is likely to be an adequate representative of its particular Numic subgroup.

The Mono material is taken from Northfork Mono Grammar, an unpublished dissertation by Sydney M. Lamb, University of California, Berkeley. The Kawaiisu material is taken from my own field notes of material obtained during the summer of 1958, under the auspices of the Survey of California Indian Languages, Department of Linguistics, University of California, Berkeley. The Southern Paiute material (often referred to for clarity of reconstruction is taken from Sapir's Southern Paiute, Proceedings of the American Academy of Arts and Sciences, Vol. 65 (1930–31).

The following symbols need comment: M, Monachi; K, Kawaiisu; SP, Southern Paiute; PMK, Proto-Mono-Kawaiisu.

2. The phonemes of PMK are */p, t, c, k, kw, ʔ, s, h, m, n, j, w, i, e, y, a, u, o/.

The phonemes of M are /p, t, c, k, q, kw, qw, ʔ, s, x, h, n, m, j, w, i, e, y, a, u, o/.

The phonemes of K are /p, t, c, k, kw, ʔ, b, d, dz, g, gw, s, h, m, n, j, w, i, e, y, a, u, o/.

3.1. Kawaiisu has two series of stops; Mono and PMK each have only one series, as is the general case for Numic. The development of a second series of stops in Kawaiisu can be explained in terms of two factors. Both Mono and Southern Paiute have voiced and voiceless phonetic stops. In each language the contrast is absent on the phonemic level. M stops preceded by /h/ are phonetically devoiced and long. In SP alternate mora units are unstressed and voiceless; stops preceding such units are devoiced. Furthermore, SP geminate stops are voiceless—single stops, voiced.

In Kawaiisu, while alternate mora units are unstressed, they are not voiceless (except before juncture, and then optionally). Accordingly, stops adjacent to unstressed

[1] I am indebted to Mary R. Haas for her helpful suggestions in the preparation of this paper.

[2] S. M. Lamb, Linguistic Prehistory in the Great Basin, IJAL 24: 2, 95–100.

[3] The details of this computation are not given because a lexicostatistic analysis is not the purpose of this paper.

syllables are not phonetically devoiced (as in SP). A second factor that has contributed to the voiced-voiceless contrast of stops on the phonemic level is the word-initial, voiced bilabial spirant in Spanish loan forms. Outside the realm of loan words, voiced stops do not occur initially. This bilabial spirant became incorporated in the K phonemic system as an allophone of /b/; the bilabial spirant initially, in free variation with [b] medially when non-geminate. There is now to be found a medial contrast between /b/, /bb/, /p/, and also /mb/ in non-loan words.[4]

3.2. In general, the derivation of K stops (S) from PMK follows the pattern:

*S$^{vl.}$	K S$^{vd.}$
*hS$^{vl.}$	K S$^{vd.}$
*SS$^{vl.}$	K S$^{vl.}$

where *h represents a lost devoicing environment. It should again be noted that these PMK elements are those least likely to maintain functional reality when further comparative Numic work is undertaken; a nasal which is present in neither M nor K is a frequent element in consonant plus stop clusters in most other Numic languages.

3.3. No cognate sets containing either K /dz/ or M /x/ were found.

3.4. Some exceptions to the vowel correspondences indicate that some type of assimilatory vowel harmony has operated or is operating in K. SP forms also often attest this. The following instances found among the numbered items in **4** are suggestive:

M	K	
-yh( )	-i?i	31
-ahi	-ehi	74
-ah	-o?o	38
-ai	-e?e	54
-ui	-uu	40
-ohci-	-oso-	92
-uwa-	-oo-	79
But -uhi	-uhi	69

Other exceptions occur in areas where both M and K phonemes have overlapping allophonic distribution, i.e. /y-a/, /a-o/ and /o-u/.

3.5. *p. *p-: M p; K p. *-p-: M p; K b. *-hp-: M hp; K b. *-pp-: M p; K p. Examples are *p-: 55–64, 66, 67 and 69–74; *-p-: 3, 4, 18, 29, 35, 42, 48, 53, 59, 65, 80 and 87; *-hp-: 68 and 91; *-pp-: 34, 40 and 98. The *-pp- reflexes could, alternatively, be derived from *-p- with the statement that *-p-, after a K long vowel, becomes K p.

*t. *t-: M t; K t. *-t-: M t; K d. *-ht-: M ht; K d. *-tt-: M t; K t. Examples are *t-: 82–88 and 90–98; *-t-: 63 and 89 (45 is a possible exception); *-ht-: 26, 30, 58 and 72; *-tt-: 4 and 37 (102 is an exception, if, assuming metathesis, the segments are comparable).

*c. *c-: M c; K c. *-c-: M c; K z. *-hc-: M hc; K z (before K i), c (elsewhere). *-cc-; M c; K c. Examples are *c-: 12 and 13; *-c-: 83 and 100; *-hc-: 20, 32, 91 and 104 (exceptions are 24 and 92); *-cc-: 11, 71 and 99.

*k. *k-: M q (before M o or M a), k (elsewhere); K k. *-k-: M q (when not preceded by M y, but occurring before M o or M a), k (elsewhere); K g. *-hk-: M hq (when not preceded by M y, but occurring before M o or M a), hk (elsewhere); K g. *-kk-: M q (when not preceded by M y, but occurring before M o or M a), k (elsewhere); K k. Examples are *k-: 25, 26, 28–30, 34, 35 and 85; *-k-: 7, 13, 16, 39, 58, 77, 81 and 102 (32 is an exception if the pertinent segments are comparable); *-hk-: 2, 47 and 70; *-kk-: 12, 51 and 65 (62 is an exception).

*kw. There are too few examples to formulate correspondences with confidence.

[4] There are three classes of K words containing the clusters /mb/ and /bb/; those in which /mb/ varies freely with /bb/, those in which /mb/ is invariant, and those in which /bb/ is invariant. No cognate sets illustrating the latter class have been found. Of the former classes, only /mb/ variants are treated in this paper.

/kw, qw/ are very rare in M and overlap in their distribution (as do M /k, q/). The ad hoc statements that follow are to some extent justified by the prominence of the "before M o or M a" environment in the statements about *k.

*kw-: M q (before M a), kw (elsewhere); K kw. *-kw-: M q (before M a), kw (elsewhere); K gw. *-hkw-: M hq, hqw (before M o or M a), hkw (elsewhere); K w. *-kwkw-: M —; K kw. Examples are *kw-: 33 and 36 (exceptions are 24 and 27); *-kw-: 10 and 94 (57 is an exception); *-hkw-: 6, 16 and 21; *-kwkw-: 14 and 45.

*ʔ. *ʔ-: M ʔ; K ʔ. *-hʔ-: M hʔ; K ʔ. Examples are *ʔ-: 1–10; *-hʔ-: 31.

*s. *s-: M s; K s. *-hs-: M hs; K s. Examples are *s-: 76–81; *-hs-: 15, 45, 81 and 86 (68 is an exception).

*h. *h-: M h; K h. *-VhV-: M h; K h. Examples are *h-, 14 and 18; *-VhV-: 8, 9, 17, 22, 41, 49, 56, 60, 73, 74 and 101 (80 is an exception).

*m. *m-: M m; K m. *-hm-, *-m(m)-: irregular. *-mp-: M hp; K mb. Examples are *m-: 38–44 (exceptions are 45 and 46); *-hm-, *m(m)-: 71, 82, 90 and 93; *-mp-: 14, 92, 96 and 97.

*n. *n-: M n; K n. *-n-: M n; K n. *-hn-: M hn; K n. *-nn-: M (h); K nn (note that K /nn/ is realized phonetically as an apical nasal with a devoiced release). Examples are *n-: 47–55; *-n-: 3, 39, 82 and 105; *-hn-: 84; *-nn-: 66.

*j. *j-, *-j-: M j; K j. Examples are 19–23, 35, 44 and 64.

*w. *w-, *-w-: M w; K w. Examples are 5, 46, 58, 60, 88, 89, 95 and 99–105 (1 is an exception).

*i. *-i-, *-i: M i; K i. *-ii-: M i; K ii. Examples are *-i-, -i: 3, 15, 18, 20, 27, 37, 40, 42, 59, 64–67, 86 and 103 (exceptions are 13, 22, 27 and 31); *-ii-: 11, 76 and, assuming metathesis, 98 (34 is an exception).

*e. *-e-: M e; K e. *-e: M irregular—i, e, a; K e. Examples are *-e-: 6 and 7; *-e: 29, 68, 87, 91 and 96.

*y. *-y-, *-y: M i (before M h), y (elsewhere); K y. *-yy-: M yy; K y. Examples are *-y-, *-y: 4, 18, 23, 34, 35, 43, 44, 50–53, 63, 72, 73, 80, 81, 92, 96, 97, 100, 103 and 105 (exceptions are 44 and 99); *-yy-: 50.

*a. *-a-, *-a: M a; K o (after labials), a (elsewhere). *-aa-: M aa; K a. Examples are *-a-, *-a: 2–5, 19, 24, 25, 38, 39, 43, 45–47, 51, 53, 56–60, 62, 64, 71, 72, 81–86, 88, 89, 94, 95 and 100–102 (exceptions are 23, 46, 54, 74 and 82); *-aa-: 48.

*u. *-u-, *-u: M u; K u. *-uV-: M u, ui; K uu. Examples are *-u-, *-u: 26, 28, 42, 45, 67, 69, 70, 93 and 95 (exceptions are 79 and 10); *-uV-: 22 and 40.

*o. *-o-, *-o: M o; K o. Examples are 8, 9, 14, 16, 21, 49, 58, 77, 78, 90, 91 and 104 (exceptions are 26, 32 and 92).

4. Mono-Kawaiisu Comparative Vocabulary[5]

1. *ʔa(w)a-, M ʔawa, K ʔaa-py, SP ʔaa-py *horn.*

2. *ʔahka-, M ʔahqa-pono, K ʔaga-ki-dy, SP ʔaŋqa-xa-dy *red.*

3. *ʔanipi, M ʔanipi K, ʔanibi, SP ʔaŋi-vi- *louse.*

4. *ʔattapy-, M ʔatapy, K ʔata-by-mi, SP ʔatagy-vi- *jaw.*

5. *ʔawa-, M ʔawa-wono, K ʔawa-tubiina, SP aŋwata- *ribs.* See 1.

6. *ʔe(hkwy)-, M ʔehkwy, B ʔewu-ce *ground squirrel.*

[5] M forms are morphophonemic and M Y is treated as y in **3.5.** K form are phonemic. SP forms are normalized whenever necessary for clarity of comparison. r is written as d, ts and tc as c, γ as g, c as s, y as j, ɪ and ŭ as y, and o as u. In addition, length marks after SP consonants and vowels are ignored unless an M or K form also has a corresponding geminate. Because Sapir indicates his frequent omission of ʔ and h, a ʔ is always written initially, and without parenthesis, before vowels; ʔ and h are inserted in parenthesis whenever an M or K form contains a ʔ or h in a corresponding position. In general upper case symbols are replaced by lower case. Only forms which Sapir called normalized were used. The use of parentheses indicates strong uncertainty.

7. *ʔeko-, M ʔeqo, K ʔegu-mbi, SP ʔgaɔ-mpi- *tongue*.

8. *ʔoho-, M ʔoho, K ʔohoo-by, SP ʔɔ(h)ɔ-vy *bone*.

9. *ʔoho-, M ʔoho-mane, K ʔoho-ʔa-dy *be strong*.

10. *ʔvkwi-, M ʔekwi, K ʔugwi-dy, SP ʔugwi- *smell*.

11. *. . . (c)c . . . , M ta-cinuh, K pucii-by, SP puci-vi- *star*.

12. *cVk . . . , M caiqoʔno, K cuki-ze *bluejay*.

13. *cVku-, M cuku *old man*, K cigu-pize *lizard* (this is suggested as a cognate set solely because of the K forms /ʔepice/ *little boy* and /ʔepize ~ ʔepic-/ *a variety of lizard*).

14. *ho . . . , M hohpohpo, K hokwo-mbi, SP (h)uqwa-mpi *spider*.

15. *-hsi . . . , M pa-hsiwah, K siho-mby *sand*.

16. *toko(hkw)a, M toqohqwa, K togowa *rattlesnake*. See 58.

17. *. . . hyʔy, M hyyhyʔy, K hyhyy *yes*.

18. *hypi . . . , M hypika, K hybijedi-dy *flower*.

19. *ja-, M jaqa, K ja-de-dy *cry*
*-ja-, M jawi, K ki-ja-dy *laugh*.

20. *johci-, M johci, K jozi-dy *to fly*.

21. *jo(hkwo)-, M johqo, K ni-jowo-duma, SP jɔgɔ- *copulate*.

22. *juhu-, M juhu, K jihuu-bi, SP ju(h)u-vi *fat*.

23. *jypa-, M jypa, K jybuna, SP jyvana- *autumn*.

24. *kwaCi-, M qwaci, K kosi-bi, SP qwasi-vi- *tail*.[6] (see also 33)

25. *ka(wa)-, M qawa, K kaa-ze, SP qaa-ci *woodrat*.

26. *kuht . . . , M kuhtu, K kudo-be, SP quda-vi- *neck*.

27. – – – – –, M kuh-kuhih, K kwihipi, SP qwi(hi)qa *smoke*. See 28.

28. *ku . . . , M kuh, K kuna, SP quna *fire*. See 27.

[6] C and V indicate, respectively, the presence of a consonant and a vowel.

29. *kop . . . , M qope, K kobi-bi, SP qɔva-vi- *face*.

30. *kahty-, M qahty, K kada baa-dy, SP kady- *sit*.

31. *kyh ʔ(i)-, M kyh ʔnoo, K kiʔi-dy, SP qyʔi *bite*.

32. *kyhc . . . , M kyh-coho, K kocugo-dy *chew*, SP qycapai *to have supper*.

33. *kwV . . . , M qawyha, K ʔata kwonubby *chin*.[6]

34. *kiippy, M mah-kiipy, K kiipy-ne *elbow*. See 38.

35. *(kV) ~ (jV)py, M jaqa-pY, K kujy-by *white oak*.

36. *kwihta-, M kwihta *defecate*, K kwitaʔa-dy *defecate, to lie*

37. *ko . . . (tti)-, M qoti, K kopakati-kwe-dy *break*.

38. *m(a) . . . , M mah, K moʔo-, SP mɔʔɔ- *hand*.

39. *manVkV . . . , M manyki, K mynaga-ju, SP manigi- *five*.

40. *mu(i)ppi-, M muipi, K muupi-ze, SP muupi-ca *fly*.

41. *muhu-, M muhu, K muhu-ce *owl*.

42. *mu – . . . – (pi)-, M mu-pih, K muzubina *beak*.

43. *myʔa-, M ta-myʔa, K mya-ze, SP mya- *moon*.

44. *myjy, M myjy, K myja, SP myjy *gopher*.

45. – – – – –, M nahtyhsuʔuh, K motasukwe *medicine*.

46. – – – – –, M nawa *father, father's brother*, K mowa-ne *father*.

47. *nahka-, M nahqa, K nagabi-bi SP naŋqava-vi *ear*.

48. *na(a)pah(i), M naa-pahi, K nabaha-ju, SP navai *six*.

49. *no . . . hsi-, M nohsi-tapi, K nohosi-dy, SP nɔnɔsi *dream*.

50. *ny . . . , M nyyhmy, K nywy, SP nyŋwy *Indian, person*.

51. *nykka-, M nyka *to dance*, K nykatya *dance house*.

52. *nykk(a)-ppV, M nyka-pe, K nykapy *dance*.

53. *nypa-, M nypa, K nybo-bi, SP nyva-vi- *snow.*

54. *na?i-, M nai, K ne?e-dy, SP na(?)ai- *burn.*

55. *nV . . . , M naho?mi, K nywaga-dy *buy.*

56. *pahaa-, M pahaa, *pestle*, K pahaa-ze *acorn grinding stone.*

57. *pahk . . . , M pa-hkwi, K pa-gy-ze, SP pa-gyu- *fish.*

58. *pahtokowa, M pah-toqowa, K po-dogowa, SP pa(a)-dɔxɔz- *watersnake.*

59. *papi-, M papi, K pabi-ne *elder brother.*

60. *pawaha-, M pawaha, K powaha-by, SP paŋwa(ha) *meadow.*

61. *pay-, M paah, K pyy-pi, SP pay-pi *blood.*

62. *pa(Ca)-, M pahca, K pa(-)ka-dy, SP paqa- *kill.*

63. *pety-, M pety, K pedy-ne *daughter.*

64. *pija-, M pija, K pija-ne *mother.*

65. * . . . pikki-, M coh-piki, K wojbiki-be *brains.*

66. *po . . . , M pohihta, K ponnia, SP pɔn(n)ia- *skunk.*

67. *pu . . . (pi), M puhsi, K pu?i-bi, SP pu?i-vi *eye.*

68. * . . . (h)pu(uhs)V, M wa?nahpuuhsa, K ?asibu-ze *butterfly.*

69. *puhi-, M puhi, K puhi-gi-dy *green, blue.*

70. *puhku-, M puhku, K pugu-ze *dog.*

71. *puCicca-, M puweci, K pumiçadize, SP pu?ica-ci- *mouse.*

72. *pyhta-, M pyhta, K pyda-bu-bbi, SP pyda *arm.*

73. *pyhy . . . , M pyhy, K pyhyy-by, SP py(h)y-vi *fur.*

74. *pahi, M pahi, K pehe-ju, SP pa(h)i- *three.*

75. *sii-, M sii, K sii-gwe-dy *urinate.*

76. *si(h)i-, M sihi-ki, *to remove guts*, K sii-bi *guts.*

77. *siko . . . , M siqo, K sigoj-dy, SP si?ju- *slide.*

78. *so(no) . . . , M sono, K soo-bi, SP sɔɔ-vi- *lungs.*

79. *suwah-, M suwah-ka, K soo-kwi-dy, SP cua- *breathe.* See 78.

80. *sy(h)ypy, M syhy-pY, K syy-by *willow*, SP cy(h)y-vi- *squaw bush.*

81. *syhsyka, M syhsyka, K sysyga *weasel.*

82. *taCanV, M tawano, K tammana, SP tam(m)a-na *Spring.*

83. *taca-, M taca-wano, K taza, SP taca- *Summer.*

84. *tahna . . . , M tahnatooh-wynyh *kneel*, K tanaa-mi, SP taŋa- *knee.*

85. *ta-, M tah-pohina *3rd toe*, K ta-pu?ibi *toe*, SP ta- *foot.*

86. *tahsitV-, M tahsitu, *toenail*, K ta-sito-bbi *fingernail.*

87. *tape, M tape, K tabe, SP tavi *sun, day.*

88. *tawa-, M tawa, K tawa-mbi, SP taŋwa-mpi- *teeth.*

89. * . . . - tawi, M petawi *west, down*, K tabi-dawi *east, down.*

90. *to . . . , M too, K tomo, SP tɔmɔ *winter.*

91. *tohp . . . c . . . , M tohpoh-ci'hci', K tobe ipiice *short.*

92. *toCVhtympi, M tohcihtypih, K toso-tymbi, SP tohatympi *white rock*, SP tɔsa- *white.* SP h may be misprint.

93. *tu(hC)u-, M tuhmu, K tuhu-kwi-dy, SP tu(hu)-qwa-dy *black.*

94. *tVK(w)a-, M toqa, K tugwo-no, SP tugwa-nu *night.*

95. *tuwa-, M tuwa, K tuwaa-na, SP tua- *son.*

96. *tympV-, M tyhpe, K tymbi-bi, SP tympa-vi- *mouth.*

97. *tympi, M tyhpih, K tymbi, SP tympi- *rock.* See 92.

98. *typpi, M typih, K tiipy, SP tyvi- *land, ground.*

99. *waccy-, M wacy, K wa-cu-jy, SP wacyŋwi, *four.* See 101.

100. * . . . wac . . . , M wacih tyky, K ?awazy-dy *hide.* M -ty- and K -dy are not comparable.

101. *waha-, M waha, K wa-ha-ju *two.*

102. *wa . . . (ka) . . . , M wacaqa, K, wogata, SP wagɔ- *frog*.

103. *wihi-, M wihi, K wyhi-ce, SP wi(h)ici, and in compounds wy(h)i- *knife*.

104. * . . . wohcV . . . , M ha?wohca, K wozia *fox*.

105. *wyny-, M wynyh, K wyny-dy, SP wyny- *to stand*.

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A COMPARISON OF FIVE SALISH LANGUAGES: V

GLADYS A. REICHARD†

6.5. Nominal incorporation
6.6. Verbal compounding
6.7. Numerals
7. Reduplication
8. Syntactic elements
9. Summary of problems
9.1. Vowel shifts

6.5. Nominal incorporation is found in many Salish languages, but in none of the five here analyzed is it very extensively used. The nouns incorporated differ considerably, but the process is similar in Till and CA. The verb complex is the same as that for nominal suffixes, the noun taking the place of this kind of suffix and being followed by the pronominal suffixes. In Till and CA an element -aɬ(-æɬ) connects the stem and noun. In Cheh and Kal the connective -aɬ seems to be lacking except in a single example in each language; -ɬ may have been absorbed by the following consonant, the vowel having dropped out.

Till examples of nominal incorporation: la c-kn-an-aɬ-gaqha·ɬ *she takes the newborn baby* (gaqha·ɬ *newborn baby*); kɬ-aɬ-təwíxʷ-i *I dig the ground* (təwixʷ *ground*); c-kəls-aɬ-yingas *you are brave* (kəlus *strong*; yingas *heart*); niš-ks-táw-aɬ-wiyá·ƛ-i *my stomach is empty* (tau *nothing*; wiyac *stomach*); a nš-ƛ'ɬ-aɬ-q'aat *I have a sore throat* (ƛ'ɬ *sore, sick*; q'aat *throat*).

The following are Cheh nominal incorporations: sa-o·l-iɬən *she is preparing food* (iɬən *food*); sa?-wináw-ɒn *he made a wedge* (winaw *wedge*); sa?-sxalxástən *make an arrow* (sxalxastən *arrow*); s-yuc-wawa?-ən *he is killing a cougar* (swawa? *cougar*); it ɔx-cwawa?-čən *I saw a cougar*.

There is no evidence of nominal incorporation in S-D.

The nouns incorporated in CA are: gugwaxtil't *baby*, cægw *behavior*, ætxʷæ?ᵉᵉ *camas*, tɕʊgwí?ɪsən *feathers*, asčíčæ?ᵉᵉ *horse*, cætxʷ *house*, q'æy'mínən *letter*, sčint *person*, smíy'æm *wife*, and spintč *year*. Examples will not be repeated here.

Vogt does not discuss nominal incorporation in Kal but the following examples are found: sxʷ-te?-ɬ-u·lu·lí *black-smith* (u·lu·lím *iron, metal*—this is the only example with the connective -aɬ or -ɬ); čin-es-kʷəl-sxʷsíxul't-i? *I am producing children* (sxʷsíxul't *children*); eɬ-n-č'e?-spu?ús *he came back to life* (spu?ús *heart*); s-č'ət-əm-sqé?lixʷ *half breed* (č'ət *half*; sqelixʷ *person*); čin-es-ta?-sqélixʷ-i *I am throwing something* (cp. CA tæp-sčínt *shoot (people)*); č'ɔ·?-sqélixʷ *several people go to complete*.

These examples illustrate the stability of a weakly developed process, the variety of the choice of nouns in the several languages, and the possibility that affixes may derive from nouns. The suggestion about the close relation of affixes and independent words made for CA seems to be corroborated.

6.6. If it is granted that there is little conceptual difference between noun and verb, nominal incorporation might be considered as verbal compounding, but there are also several interesting examples that distinguish the two processes. Closely related to both is the CA form -ipɬtixʷčč *tongue*. This was treated as a suffix, and discussed as an incorporated noun (CA §§515, 622.) Kal has something comparable in the use of epɬ *have*, though I have found no example of compounding with nominal incorporation similar to the CA. In Kal epɬ is used a verb stem, as æpɬ may be in CA.

In both Interior languages there is evidence of verbal compounding. In CA the pattern is stem-nominalized verb as gwiy'-æ-sk'ul' *he finished doing it*; ic-gwiy'-æ-snič'-əm-s *he is finishing cutting it*. Apparently the element æ is the prepositional

particle, and the second example with continuative pronominal suffix shows the nominal incorporation. Examples from Kal are comparable: kʷené cis-uí-sk'ul'-i *wait until I finish some work* (cis > čin-es; Kal ui, wi > CA gwiy'); χs-téye? *skunk* (χs *bad*; téye? *bad*; CA allows compounding of χæs *good*, with other verbs).

Numerals sometimes seem to be compounded stems in Kal: čin-ms-ł-kʷ'e?-ém *I'll take four bites; I'll bite four times* (ms *four*, -ł *times*; kʷ'e? *bite, chew*); esə-nk'u?-ł-aíl-i *he is taking one bite.*

Till has some verbal compounding, casually discussed by Edel. She lists ya, yał *become, make*, as a prefix, and explains that it verbalizes. Perhaps complexes with ya are compound verbs, and possibly a few other stems are auxiliaries. Cheh sa seems to correspond with Till ya, yał.

Cheh has a mere trace of verbal compounding: ƛ'a ?ó·l-iłən *look for food*; this may possibly be so interpreted, since iłən means *food* as well as *eat.*

Since examples of verbal compounding are few, and the subject has been discussed at length only for CA, all the auxiliary stems found have been listed: *bad* CA č'æs, Kal č'es-; *be first* CA ši?ɬt; *design, mark* CA q'æy'; *explain* CA miy; *finish* CA gwæy', Kal ui, wi; *go* CA xui (s.); Till ʒu; *good, well* CA χas, Kal χs (*bad*); *have* CA æpł, Kal epł; *hurry* CA χʷæn; *make, create, prepare, do* CA k'ul', Till ya, yał, Cheh sa; *negative* CA lut; *pretend* CA yuqʷæ?ᵉ; *procure, secure* CA yæᵉ, Till ya, yał, Cheh o·l (*look for*); *take, hold, carry one object* CA kʷin; *try, want* Till dæš.

6.7. Numerals are treated as verbs; a comparison follows: CARDINALS INDEPENDENT FORMS: *1* CA nækʷ'æ?ᵉ, Kal nk'u, Till nač'-, Cheh o·cs, o?c's, S-D díč'o; *2* CA ésəl, Kal ?esél, Till higi, haigi, sæli, ʒu-, Cheh sá·le, S-D sáli; *3* CA čí?ɬæs, Kal če?ɬé(s), Till čénæt, Cheh čá·la, S-D ƛixʷ; *4* CA mus, Kal mus, Till wus, wis, Cheh mo·s, S-D bos; *5* CA cil(čt), Kal cil, Till c'χəs, Cheh ce·l-əčs, S-D cəl-ác; *6* CA tɬéw'šæ(čt), Kal ťaq'ən, Till yil-h-áči, Cheh ťəχəm, S-D cəl-áci; *7* CA cún-čt-əm, Kal sísp'əl', Till tčus, Cheh c'ə·ps, S-D coks; *8* CA hæ?ín'-əm, Kal he?én'əm, Till łq-éči, Cheh cá·-mos, S-D təqáči; *9* CA χa-χan'-út, Kal χχan'út, Till liyú, Cheh ta·wxʷ, S-D xʷol; *10* CA upən(čt), Kal ?úpən, Till ah-ančs, Cheh pá·n-ačs, S-D pádəc.

11 CA úpən ul-nækʷ'æ?ᵉ, Kal ?úpən eł-nku, S-D pádəc əkə déč'o; *20* CA æsæᵉl' úpən, Kal ?esəl'-úpən, S-D sáləači; *30* CA čæ?ᵉł-æᵉl'-úpən, Kal če?ł?-úpən, S-D slíxʷəči; *40* CA mus-æᵉl'-úpən, Kal ms-ł?ə-úpən, S-D (s)bóseči; *50* CA cilč-l'-úpən, Kal cəlč-łə-?úpən, S-D scəlácəči; *60* CA tawšæč-l'-úpən, Kal tq'anč-łe-?úpən, S-D scəláči?ači; *70* CA cunčm-æᵉl'-úpən, Kal sp'əl'č'-łə-?úpən, S-D cókseči; *80* CA hæ?æn'm-æᵉl'-úpən, Kal hén'əm-łə-?úpən, S-D stə́qáči?eči; *90* CA χa-χn'-ul'-úpən, Kal χχan't-łə-?úpən, S-D sxʷoláči; *100* CA nuk'ə°-qín, Kal čank'ɔ?-qí(n), Cheh pa·nčs-o·mš, S-D díč'o səbqʷ'áči.

200 CA a?asál'-qən', Kal ?ese?l sə-nk'ɔ'-qi, S-D sáli səbkʷáči; *300* CA čə-ča?ᵊlás-qə́n', S-D tlixʷ səbkʷáči; *400* CA m'-m'ɔ́s-qən', S-D bosəbkʷáči; *500* CA cə-cæl'čt-qən', S-D clac səbkʷáči; *600* CA tə-tuw'šáčt-qən', S-D cəláči səbkʷáči; *700* CA cu-cón'čtm'-qən', S-D coks səbkʷáči; *800* CA hæ?ínəm hæ s-nuk'ɔ?ɔ-qís, S-D təqáči səbkʷáči; *900* CA χaχn'út (h)a s-nuk̓ɔ?ɔ-qís, S-D xʷol səbkʷáči; *1000* CA u?ópənčt-qən', S-D pádac səbkʷáči; *10,000* S-D pádac táwosəd.

Except possibly in S-D, numerals of all the languages are modified for counting specific objects; Till and CA have affixes with the same stems and some phonetic changes, including change of accent; they are prefixes, suffixes of the nominal type, or a combination of both.

In Kal the same numeral stems or shortened forms are used with nominal suffixes similar to those of CA, for example, ?esəl-éłxʷ *two houses*, the accent being on the suffix, except for mus *four*. Vogt lists a separate category for counting persons, but examination of the forms shows that there

is a prefix č- which corresponds with CA tč- used to count persons.

In Cheh there are some different stems for counting several kinds of objects, that is, stems used in compounds:

	Stem	Blankets	Fires
1	næč'aw-	næč'á·w-ec'a	——
2	ca·m-	cá·m-ec'a	ca·m-stq
3	čanaw-	čaná·w-ec'a	čaná·w-stq

From *four* (mo·s) on the same stems are used for absolute forms and compounds. It should be noted that cá·mos *eight* is the stem for *two* in compounds, hence *two-fours*: cp. cá·mos-ta·lxʷ *eight houses*.

Tweddell refers to S-D personal numerals which probably correspond with what we call 'compounded' numerals in the category of persons. They are somewhat irregular, but seem to use initial reduplication (bə-bós, bə-bóč *four persons*), final reduplication (cəl-əl-ác *five persons*) with suffixes of the same kind used in the cardinals. The forms are not quite clear because they involve contractions not worked out.

An interesting fact evolves from the comparison of the numerals, one that has already been indicated by the comparison of CA and Kal stems. Whereas CA tends to preserve the stem vowel or vowels, if it be bisyllabic, Kal tends to shorten the stem vowel and to throw the accent to the following suffix, sometimes even losing the initial vowel completely. The Coast languages (few examples for Till) lack the first vowel entirely and strengthen or lengthen the second vowel, for instance, CA ásəl, Kal ʔesél, Till sæli, Cheh sá·le, S-D sáli; CA úpən, Kal ʔúpən, Cheh pá·n-ačs, S-D pád-əc.

Incidentally, the Till nač'- and Cheh compounding stem næč'-a·w- are comparable with the CA and Kal absolute stems.

The CA and Kal numerals form a fairly consistent decimal system, the units 1–10 implying, even if they do not always express, the fingers or hand (-ičt, -čt). The tens are the digits multiplied (-æl, -ł) by ten, and the hundreds are reckoned on the basis of heads (-qin, -qən', -qł). It is not clear why the CA forms are diminutive. It should be noted that the Kal form for *two hundred* is nominalized as *two one-heads*.

Oddly enough, Edel does not isolate a nominal suffix for *hand, finger*, but the numerals suggest -ači, (-æči) *finger*, and -ančs *entire hand*, which has been added as a distinct suffix to the list.

Tweddell does not differentiate S-D -ači (-əči) *hand*, and -ač (-eč) *head*, so that it is impossible to determine where the digits leave off and the *heads* begin, but it is obvious that the S-D system is organized on the same principles as CA and Kal. Accent may be the distinguishing feature.

CA numeral adverbs are the same as those mentioned for tens, that is, -æł is suffixed to the cardinal numeral, and as usual, certain phonetic changes take place because of contraction with stem finals.

Cheh is consistent in suffixing -šin *foot* (?) to the stems used in compounding: *once* ná·č'o-šin (< na·čaw-šin, possibly na·č'aw-ta-šin); *twice* cá·m-šin; *3 times* čá·n-o-šin (< ča·n-aw-šin or ča·n-aw-ta-šin); *4 times* mó·s-a-šin; *5 times* cíł-čt-a-šin; *6 times* ťaxóm-ł-ta-šin; *7 times* c'ó·ps-ta-šin; *8 times* cá·mos-ta-šin; *9 times* təwíχʷs-ta-šin; *10 times* pá·nčs-ta-šin.

Obviously there are significant changes due to contraction, but apparently Cheh has a suffix something like -łta corresponding with S-D -ał and CA -æł times.

The first two S-D multiples are irregular č'æxʷ *once*; cəb-áb *twice*. From three on -ał is suffixed to the regular cardinal stems. The form for *twice* suggests that S-D, like Cheh, has a different stem form for some compounds.

7. Reduplication in Salish, like nominal suffixing, has been studied rather extensively. Since, as we have seen, there is little difference between nouns and verbs, the processes of reduplication characteristic of Salish may be treated generally. The processes agree quite well for the five languages,

with some distinctive processes for each, some lacking in the Coast languages.

Duplication of the entire stem, or if the stem ends with a consonant cluster, of CVC of the stem, indicates a distributive or frequentative, often considered a plural.

In Till the vowel of the duplicated stem that characterizes the frequentative seems to be i. Whatever the stem vowel may be—a, æ, i, u, or zero—the reduplicated vowel is i: ga ni-ná-ən *he will keep coming after* (na- *fetch*); ga-iq-uqí-i *I will skip around* (aqi *run away*); c-ih-ʔaha-wí-ni *I always take it* (ʔaha *carry, take*); t ši-šæč'-ən *she is cutting repeatedly* (šæč' *cut*); du wu-c-yil-yæl-ɬéqun *he twists them*; t ga-i-íwuč *they will paddle upstream* (iwuč *go upstream*); ła nš-giɣ-guɣ-isú-i *I always ford* (guɣ *cross water*); daš-dí·t'č-ən *he shot until he killed it* (t'č *shoot*).

Edel differentiates plurals from frequentatives, but they are probably the same; at any rate, the plurals she gives are formed in the same way, sometimes with vowel variation, not uniformly with *i* for the reduplicated plurals: łx-łɬéx-is *they were blind*; łah-łah-ais-u *they were all sleeping together*.

Cheh frequentatives: təpt-tp-tən *he hammered it frequently*; yú·t-yut-ʔən *she stirred it frequently*; s-ʔe·kʷ-ékʷ-tq *he stole repeatedly*.

S-D frequentatives: s-χál-χal *books* (χal *mark*); yál-yal-šəd *moccasins*; lə č'áxʷ-č'axʷ-əd *he repeatedly hit him with a stick*; u-t'óq'-t'oq'-əb *he coughed and coughed*; u-bə́d-bəd-č-əb *he keeps on lying* (badč *tell lies*); u-bə́d-əbid-čił ti dəgwi *we lied to you*.

CA plural distributives: t-čɬén'-čən'-əm *he held on with both hands*; gwɬép-gwʊp-šən *his feet have long hair*; q'ɬét'-q'ət'-p *they climbed one by one*; Ráw-Raw-p *it dropped here and there*; ù-čæp-číp *they are soft, softening has become a part of them*; úc-ɔcqæʔæ *they went out one by one*; ít-əč *they slept*.

Kal plurals: ʔet'-ít š *they slept*; ʔel'-íln *they ate*. (Vogt considers these two examples irregular; to me they seem to fit the pattern, with change of vowel and glottalizing of consonant.) esə-n-cɔ-cɔ-łníʔut *he has fringe on both sides*; łuʔ-łuʔ-áχən *I stung his arms*; q'aʔu-q'aʔu-p-áχən *his arms broke*.

In Till repetition of the initial stem consonant and vowel, or of the initial stem vowel indicates plural. In all types of reduplication, as well as in other Till compounds, certain voiceless sounds are voiced: ła-c-wá-waɣ-án *they are crying* (waɣ *cry*); ga čɪ-čɪɣ-il *they get to him* (čiɣ *reach*, note that initial č does not become ǯ); də da-tæl-áwin *they took off* (*their skins*) (tæł *take off*).

Initial reduplication indicates diminutive in all the languages except Cheh. The types of initial reduplication vary considerably. In Till the initial consonant of the stem is repeated, voiceless stops and affricates are voiced, and the stem vowel, no matter what it may be, is changed to u: hanáluin *arm*, hu-hanáluin *little arm*; šæns *stone*, k-šušénš *gravel* (k- plural); t'iyílhu *man*, du-t'iyílhu *boy*; tuqusu *beaver*, du-tuqusu *little beaver*. (Note that t' > d in this process—as well as in others.)

In S-D the stem initial consonant or initial consonant and vowel are repeated for diminutive: kəbátəd *knife*, kə-kəbátəd *little knife*; sládayt *woman*, slá-sladayt *little girl*; stobš *man*, s-to-tóbš *boy*.

In CA initial reduplication is accompanied by glottalization of certain consonants in the entire word—m, n, y, l, r, R, rʷ, except n in hɪn- *in*. Some vowels also change, especially stem vowels: hɪn-q'u-q'us-əm'-íčɪn'-šən' *dog, on-the-bottom-of-feet-small-wrinkles*; šəšəl'-úlʊm'xʷ-n' *hoe, that-which-gives-the-ground-little-chops*; č-n'ə-n'á^{ə}-n'a^{ə}s *we little ones became wet* (nas *wet*); æ-ʔít. š *little one slept* (it. š *sleep*).

In Kal initial reduplication is used for diminutive with certain phonetic changes: the voiced sounds—m, n, w, y, l—may be glottalized, but the rule seems not to apply to all these consonants in the complex. If the stem contains two glottalized sounds, the first is deglottalized, and stem vowels may be changed. Diminutives often have the prefix ɬ: n-qʷ-q'ɔs-əm'í(nčən-šən) *dog;* es-čɬ-q-q'al'-íʔ *small lake*; es-č-ɬ-sú?-sənkʷ *small island*; s-ɬ-kʷ-kʷʌ'ús *little face*; ɬ-pu-ps *kitten* (pus *cat*); ɬ-xʷ-xʷist *little one walked, he walked with little steps*; es-k'ú-k'ʷəl-í *he has a*

tittle job (cp. es-k'ul'-i *he is working*); i-ɬ-qʷ-qʷɬ' *dry snow, a-little-cooked*; ɬ-em'-úʔm-t *little one sat* (ʔemút *he sat*).

Till, Cheh, and S-D do not seem to have medial reduplication.

Medial reduplication, that is, repetition of the stem vowel, is a CA process that indicates *gradually becoming without volition*; the vowels are separated by a glottal stop: luʔup *it became dry, it dried out* (lup *dry*); naʔas *it became wet* (nas *wet*); hɪn-taʔaχ-ɬgwæs *he became worried* (taχ *bitter*).

Vogt does not list this type of reduplication for Kal, but forms like the following suggest the process and function as comparable with CA: čin-naʔas *I am getting wet*; xu-xuʔús *they were awake, they wakened* (ʔ); paʔáq *it is fading* (paq *white*); k'ʷaʔál *it grew* (k'ʷal *grow*); tiʔim *snow melted* (tim *melt*); čin-suʔum *I smelled something* (suʔ *smell*) peʔexʷ *it swelled*.

Final or terminal reduplication is a process of all the languages. Usually the vowel of the stem and the final consonant are repeated. Often the vowel has a weak form when repeated, or it may be lost entirely. If the stem form is CVCC, or CVCCC, the first consonant of the cluster is repeated. The character of final stem reduplication in Salish stems seems to corroborate the theory advanced for CA, namely, that the final consonant of a cluster is a remnant of a suffix no longer free (CA §598).

Final reduplication in Kal is of the same sort as in CA, apparently with nearly the same meaning. Often, but not always, the stem vowel is lost, and sometimes a final non-glottalized consonant becomes glottalized.

Till has a distinctive type of reduplication in which the final stem consonant is repeated before the stem; Edel has interpreted it as a process expressing plural or continuative: dæš q-tə́q-ən *they tried to break it* (tq *break*); da s-ɬ-túl-ən *they went and told him* (t.ɬ *tell*); niš-k-duk' *they put her in* (*their canoe*) (dak *lie*; note thāt kʼ is deglottalized); an-s-ɬ-ga·ɬ *my eyes* (ga·ɬ *eye*); š-áš-un *he is holding it* (æš *hold*); q-ʒúq-il *they climb* (cqil *climb*); nš-q-ɬə́q-il *he is sitting in it* (ɬaqil *sit*).

This type of reduplication seems to corroborate certain theories about the stem and its relation to stem suffixes already put forward, namely: if the final consonant of the stem can stand at the beginning of the complex as well as at the end, the stem sounds have the same value no matter what position they occupy.[1]

If the final reduplication of bisyllabic stems such as cq-il *climb*, is q-ʒuq-il, and of ɬaq-il *sit*, is q-læq-il, the reduplication shows that the stems are of the form CC or CVC and that elements like -il are suffixes. Consequently the stems are not bisyllabic, but monosyllabic with a theme suffix. So far I have found no Till stems of the type CVCC. If they should occur we could test the theory of the function of the second consonant of the cluster as a contracted suffix by the process of final reduplication. Perhaps this combination of circumstances may be found in some Salish language not considered here.

The following examples of final reduplication in S-D are listed with Tweddell's translations: u-tas-s-tə́s-əd *he is hitting it hard* (Tweddell calls this form augmentative; I find no other example like it; cp. Cheh ta·s *hard*); u-χál-ɔ́l-os-čixʷ *you have a little mark on your face* (cp. u-χál-os-čixʷ *you have a mark on your face*); u-xú-ʔuy-əd *he is only half working* (cp. u-xúy-əd *he is working*). Other examples of diminutive in S-D have initial reduplication.

A single example of its kind, final reduplication of changed vowel with consonant cluster, seems to suggest the meaning of gradual change: lə búkʷɬ-akʷɬ *he was getting hurt all the way over there* (cp. lə bakʷɬ *he was getting hurt*).

Most of the languages have a combination of the various kinds of reduplication, as diminutive plurals in CA with glottalization and initial reduplication for diminutive, stem duplication for plural, and medial vowel reduplication for *becoming*.

Till expresses inceptive or incohative by

[1] IJAL 11. 51ff (1945).

double initial or final reduplication: da s-łi-l-ƛ'ł-i *I am beginning to sicken* (ƛ'ł *sick*); ła c-yi-yi-yahis-úi *I begin to see* (yahs *see*); nš-i-i-as-asnáχʷ-i *I begin to know* (asnuχ *know*); gə-iəl-ǽlil *the tide comes in slowly* (alil *water moves*).

A kind of reduplication, apparently not very productive, is the reduplication of suffixes. The following are examples from CA: ɪc-χum'-ʊm'-ílt-ælt *she has come to miss her children* (-ilt *offspring*. The repetition of -ilt is plural rather than diminutive, hence l is not glottalized); c'æl'-əl'-íš-ıš *he came to a standing position* (c'æl' *one stands*; -iš *act of*); æm-əm-íš-iš *he came to a sitting position* (æm *one sits*); caq-caq-aq-əl-íp-æp *he fell on his back* (caq *hollow object stands*).

The following may be a comparable example from Kal: łq'-al-íłš *they lay down* (*one at a time?*) (łq' *one lies*).

The repetition of a stem syllable, possibly a suffix, in S-D may be comparable: tu ʔəxʷ tóq'-ob-əb-čił *we wanted to cough* (toq'ob *cough*); ʔál-al, ʔál-ʔal *house*; ʔál-al-al, ʔál-ʔal-ʔal *houses*.

The summary does not include all exceptions or unusual forms found in all the languages, but only the general similarities. Differences in meaning are indicated by accent in CA, and possibly in the other languages also. An accompaniment of reduplication is a change of vowel—the vowel may be weakened or lost as in Kal, it may be changed in character as in Till, S-D, CA, or Kal; usually the resulting vowel depends on the accent. Glottalization is another morphophonetic process closely related to diminutive reduplication in CA and Kal; it is not uniform for the two languages, even though the same consonants are glottalized. In addition to reduplication, some Kal plurals are glottalized; actually they are distributives or repetitives.

In Cheh the glottal stop after a changed stem vowel indicates diminutive without reduplication. There are, however, many unexplained glottal stops. So far the function of glottalization for contraction has not been tested.

8. Some of the most important elements of any language are the syntactic elements or words because they are so subtle that they may be the key to the entire meaning of an utterance. Their meanings usually depend on the context, and no one of these elements is exactly the same in two languages even though the forms may be similar. Despite the fact that prefixes sometimes indicate English prepositional ideas, all the languages have a general preposition which may mean *at, by, by means of, in, into, on, through*; Till a, as; Cheh aɬ; S-D ʔal, ʔəl; CA prefix æ-, and Kal 1.

There some other prepositions, but since they seem to be independent words, they belong to the vocabulary and are included in the following comparison. Some other syntactic elements that may assimilate to the verb complex are also included, indicated as prefixes.

About, around Cheh taš, taš aɬ; *across, through* Cheh taš yímaxʷ; *already, surely, absolutely, quite* CA tiʔˈ, Kal tł'e, Till datʊt; *also* CA χæl, łoqʷ, Kal nexʷ, Till iyu; *although* CA cut, Kal we; *and* (correlative) Kal u, Till i, Cheh ča; *and, yet, but* CA hił, ł; *and so* Kal kʷ'ə, S-D kʷi, kʷə, gwə; *and then* Kal kʷ'em't, Till dəla, Cheh ən, S-D kʷəl, gwəl; *answer to question, not yes or no* CA tuʔᵘ; *as far as* CA pænæʔᵉᵉ.

Because CA æy'niɬ, Kal néliʔ, Till k'alus, S-D kʷəl, gwəl; *because, so that, purpose* CA tgwæl, Kal χʷəl', Till nšʔała, S-D gwə, gwəti; *by* Kal kʷłu.

Contrary to fact, if only Kal kʷše; *doubt* CA næʔᵉᵉ; *either . . . or . . .* Kal χʷa . . . χʷa, Cheh ƛ'eˑ, ókʷ'a, S-D diɬ, dəl.

Finally CA sıc, šıc, Till łani; *finally, and then* CA hɔi, Kal hɔi, Cheh hɔi; *from* CA tæl', Kal təl', Cheh to aɬ, tul; *from afar* Cheh to łaʔ; *future intentional* CA čæł, Kal qeʔ, qł, Cheh ƛ'a, ƛu.

How Cheh ənɔˑm'; *if, when* Kal ne; *if in*

future Kal nem; *if . . . then . . .* CA næ?ᵉ . . . næ?ᵉ, S-D abil; *if . . . were true* Kal kuné u . . .; *interrogative* CA ni, Cheh ʔiˑ, na; *interrogative after all . . ., did . . .* CA čin', Cheh čən, S-D χəd; *interrogative expecting answer 'no'* CA ni lut, Kal təmá.

Just, exactly CA šił, Kal put, Till ələ, Cheh iyuʔ; *just at the moment* CA u-šił; *just ready to . . .* CA u-čæł.

May, possibility CA χił, S-D til; *might, threat, evidence that . . .* CA χæliʔ¹, Kal χi; *must* Cheh q'æl; *not* CA lu, lut, Kal ta, tam, Till qæš, Cheh meł, S-D xʷe; *now, today* Kal yetəχʷá, Cheh ta nin.

Only Kal čəmí, Til χʷi; *only, no more than, still (dubitative)* Kal put i; *ought, obligation* CA čæ?ᵉ; *past, no longer* CA cmiʔ¹; *perhaps* Kal kuntá, Till niga, Cheh ta, S-D tu; *perhaps?* Kal uc, χʷa uš, Cheh itoʔ; *please* Kal ƛ'emi, mi.

Similarly Kal ec'aχi æ, Cheh q'eˑcx; *some or other* Kal teʔ, Cheh taˑm; *some time ago* Kal χʷa cpiˑstém'; *soon, after a short time* Kal iłtt.šen'é; *still, yet* Kal čitəłχʷá; *than (comparison), very, too much* Kal mił; *then, this (emphasizes following word)* Kal še, Till q'it, q; *to, toward* CA tæč, Kal č'-, Cheh šaɬ, š; *truly* Till hagunax; *until* S-D tʷəl.

What thing CA (s-)tim', Cheh taˑm, S-D s-tab; *what is it?* CA ɪngwæt; S-D gwat; *when in future . . . then . . .* Kal m- . . . m-; *where* Kal hičæ?ᵉ; *wherever* Kal ne tčən'; *who* CA sɛ́gwæt, Kal suwét, S-D gwat, gwət; *wish* Kal kumí; *with, accompaniment* CA twæ, Kal t-, Till təč, S-D tʷ, tʷəl.

9.0. The many Salish languages are distributed from the isolated Bella Coola in British Columbia north of Rivers Inlet, with many small groups around Puget Sound and along the Coast to the Tillamook who lived south of the Columbia River. Salish languages spread inland from the coast to the upper reaches of the Missouri and Yellowstone rivers, the Flathead being the most southerly tribe, the Plains Salish and Sematuse (hardly known) the most eastern. Other inland Salish tribes occupied territory from the Columbia River at the south to the Fraser and Thompson rivers at the north, the Shuswap being the northernmost tribe.

The Boas-Haeberlin paper on sound shifts was the result of a reconnaissance of the entire area. This study, based on vocabularies, indicates some of the more obvious problems of Salish, and the distribution of the k and č languages. In 1950 Swadesh published a revised classification of the languages.[2] One of Swadesh's purposes was to determine—largely from vocabularies—some of the subdivisions of Salish; the classification sets off major divisions, subdivisions, dialects and subdialects. Differences in the two classifications are of minor importance so far as our comparison is concerned.

Coeur d'Alene is a single extreme member of the Interior Division; Kalispel and Spokan are considered members of a subgroup of the Okanagon Group of the Interior Division; Colville as a member of a different sub-group of the Okanagon Group. Tillamook is one of two members of the Oregon Division (whose only other member is Siletz) which parallels the Coast Division. Upper Chehalis is assigned to the Olympic Branch of the Satsop Group of the Coast Division, and Snoqualmie-Duwamish are dialects of the Nisqually sub-branch. All are č-languages except Upper Chehalis which is transitional.

The five languages are therefore quite representative of a large cross-section of the family, and this is no accident. All the languages compared except Kalispel were done under Boas' aegis as a result of his earlier reconnaissance. He planned to get records of all the languages, but felt that each had relative importance as compared with the others. He would have advised that Shuswap, Lillooet, or Thompson be done next instead of Kalispel because of their divergences, but Vogt consulted Boas

[2] IJAL 16. 157-67 (1950).

only briefly after he had decided to work on Kalispel. One reason for his choice, I presume, was the inadequacy of Giorda's Kalispel grammar and dictionary, and of Mengarini's Flathead grammar.[3]

The relation between even five languages of such a large family as Salish illustrate *process* which should have an important place in linguistic theory. A relatively simple phonetic change from k to č may be amply demonstrated for several language families, but in this study the dynamics are apparent. Rarely are two related language so regular that one sound has changed completely, as have k and č, and š and x. So complete are these changes in CA and Kal that k and x are non-existent in them. Chehalis has k, the transitional k^y and č, and Colville, according to Vogt, has k, k' and x, all 'with a definite i-timbre'. Colville occupies a geographical position intermediate between the Coast and the Interior. In this respect a 'reasonable' or 'logical' phonetic change is fully demonstrated with its theoretical transitional forms.

Vowel changes from a through ɛ and æ are similarly shown by Kal ɛ, CA æ, but the available materials are not clear about vowel relations. The recording does not distinguish the relations of a to i and the intervening gradations as a, e, ɛ, i, or a, æ, ɔ, u and i-u, all of which are indicated. Factors other than pronunciation are involved here, some having to do with morphology and accent, others with the relation of vowel to consonant.

Another interesting problem is the fact that in some of the languages an initial vowel is preceded by a glottal stop. This is not the case in CA, but the fact that s- plus an initial vowel > y', and that other consonants in the same position become glottalized, suggests that somewhere along the line an adjustment was made which is so far not entirely clear. It is however highly suggestive that in Spokan the initial vowel is preceded by an aspiration (distinct from h).[4] The functional pairing of the glottal stop and aspiration in other languages (Navaho, for example, and probably other Athabaskan languages) certainly makes this point theoretically significant. Moreover, the effects of s, y and ?, though not obvious or widespread outside the family, should be examined for the Salish in general.

The possibility of demonstrating the change from relatively isolating to agglutinative or polysynthetic structure has already been mentioned; a thorough examination of this problem from West to East or from East to West would prove very fruitful. We shall have to reconcile ourselves to the possibility that we cannot prove where a form originated or in which direction a process traveled, but certainly the development can be dynamically established for Salish.

In Salish noun and verb are so thoroughly interchangeable in many cases as to be hardly differentiable. When the vocabularies have as many nominalized as independent forms, and when verbs are inflected with nominal possessives as in CA and Kal, surely the problem of determining which is which is a major one. Perhaps we shall have to conclude that noun and verb are not completely distinct. The fact that stems or bases are relatively free in this respect, and that there is a readiness to use them indifferently as verbs or nouns, seems to me good evidence of their verbal character. If, however, someone else interprets them as nominal, it does not make any difference; we may compromise on nominalized verbs or verbalized nouns. There is no convincing evidence, either quantitative or qualitative, to conclude that either noun or verb was original.

Conclusions about origin and chronology must also remain tentative, especially when we note the relation of affixes to nouns or

[3] Father Giorda, A Dictionary of the Kalispelm Language, Jesuit Fathers, no date; Reverend Gregory Mengarini, A Salish or Flat-head Grammar (1861).

[4] Vogt, Salishan Studies, p. 10.

verbs, or of demonstrative elements in the Coast languages to aspective elements in the Interior.

9.1.1. A major change noted in the Boas-Haeberlin work is the shift from a to i. The statement has validity but needs revision in view of the phonetic relations of all the vowels, depending on factors such as accent, vowel harmony, and morphology. This is a question well, but not conclusively, documented for Coeur d'Alene and Kalispel, but it has not been thoroughly worked out for the latter, and has been merely suggested for the other languages. All the vowels of any one language are interrelated and are in turn influenced by the consonants: for instance, æ > a, u > ɔ under the influence of bilabials such as *p*, *m*, and of the post-palatals or velars. Under the same influences and with accentual change i > a or æ. Changes of this kind differ in the several languages and should certainly be determined for each before a conclusion can be reached about phonetic relationships among the languages. In order to make valid comparisons the stem vowel with accent should be discovered if it is at all possible. Generally a test form is the third person completive form which has no affixes (CA, Kal, Cheh, S-D).

Internal vowel changes are suggested by comparison of the two most closely related languages, Coeur d'Alene and Kalispel. They have been determined only because a large number of comparable forms have been made available through systematic grammatical interrogation and the recording of contexts. The same kinds of material are available also for Chehalis but unfortunately there has not been time to do more than systematize them roughly. A few of many examples will be cited for CA and Kal.

Some suffixes and stems have the same vowel in both languages, sometimes with a modification of accent, with echo vowel, or glottalization. (The forms given are those with the strongest vowel, determined by stress. CA allows consonant clusters with a nasal, Kal does not.) Suffixes: *back* CA -ičn', Kal -ičən; *edge*, *mouth* CA -cin, Kal -cin'; *foot* CA, Kal -šin; *head* CA, Kal -qin; *surface of round object* CA -i?ˈst, Kal -ist. Nouns: *arrow* CA t'ápæmən, Kal t'a·pəmín; *younger brother* (*man-speaking*) CA síncæ?ᵂ, Kal síncə?; *buffalo* CA cúləm, Kal s-cúləm (*bull*); *caribou* CA st'íyałc'æ?ᵂ, Kal stiyé-(łc'e?); *cow* CA st'amá(ltumš), Kal st'əmá *enemy* CA šǽmən', Kal šəmén'; *feathers*, *fur*, *body hair* CA, Kal spum; *fly*, *insect*, *maggot* CA hamǽltəmš, Kal χamáltən; *heart*, *desire* CA icpú?us, Kal spu?ús.

Stems, verbal and nominal, in which the vowel is undisguised by other factors, very few of many are cited: *astonish* pas; *boil*, *bubble* mal'; *friendly* CA laχ Kal l'aχ *gape*, *split in two* saq'; *look at*, *watch* CA ac'χ, Kal ac'əχ; *pay*, *reward*; χaq'; *rotten* naq'; *stand* (*of container*) caq, Kal has also caqʷ; *tired* CA ayχ, Kal ?aiχʷ; *wet* nas; *feed* CA æm (*share food*), Kal ?em'; *good*, *well* CA χæs, Kal χes; *lie* (*persons*) CA mæł, Kal meł; *milk*, *press*, *squeeze* CA p'æy', Kal pe?; *sit* (*one*) CA æm, Kal ?em; *surface* (general stem) CA č'æm, Kal č'em; *blanketed* sic'; *cheat* qʷil; *cut with blade* nič'; *eat* CA iłən, Kal ?iłn; *muscle*, *sinew* tinš; *tongue* tixʷčˇ; *absent*, *empty*, *gone* CA č'uᵘ, Kal č'uu; *blow* (*with mouth*) puxʷ; *borrow* (Kal *lend*) kuł; *carry* CA ukʷ, Kal ?ukʷ; *crowd*, *swarm* CA tuᵘ, Kal tu; *nasal mucus* CA snɔs, Kal sənɔs.

The preceding examples show CA æ to be equivalent to Kal e (ɛ). In the following CA æ > Kal a: *bright*, *clear* CA χæl, Kal χal; *bury* CA læq', Kal laq' (*be in sweathouse*); *consume*, *use up* CA c'æs, Kal c'as; *fight with blows* CA tiy'æqʷt, Kal tiyaqʷt; *fry* CA c'æχ, Kal c'aχ; *grind*, *sharpen* CA xʷæqʷ' (*grind meal*), Kal χʷaqʷ'; *swallow* CA q'æm, Kal q'am; *two* CA æsəl, Kal ?asəl; *white* CA pæq, Kal paq.

CA has a change of vowel i > æ, used for derivation, for example: kʷæl' *be hot*, *sunny*, *warm*; kʷil *become red*; kʷul *be red*; t'æš *sweet*; t'iš *be sweetened*. Possibly the

same process applies to Kal. If so, it can rarely be learned from the translations (cp. *white* CA paq, Kal piq; *fade* CA pæq, Kal paq). But even if the rule applies, there is a change of vowel in the two languages.[5]

Moreover, there may be a vowel change in diminutive reduplication, CA æ > Kal i. An attempt has been made to eliminate these functional changes in the following examples which show CA æ > Kal i: *all, complete* CA mælkʷ', Kal milkʷ'; *bend* CA pæn', Kal pin'; *camas* CA ætxʷæʔᵊᵐ, Kal itxʷeʔ; *chop, split* CA šæl, Kal šil; *finish* CA gwæy', Kal wi, uiʔ; *house* CA cætxʷ, Kal citxʷ; *leaf* CA pécčilæ, Kal picčł; *level, beat in wrestling match* CA šæť, Kal šitť'; *lie* (*long objects*) CA p'æn, Kal p'in; *stand* (*long objects*) CA šæť, Kal šiť; *stand up, project* (*long objects*) CA c'æl', Kal c'il.

The reverse relationship is shown by the following examples accented on the vowel considered: CA i > Kal e (ɛ): *body, flesh, meat* CA qiltč, Kal sqeltč; *brother, wife's sister* CA qičč, Kal qečč, and a very large number of nouns, stems and suffixes. Probably this vowel change is the most regular and significant of them all.

9.1.2. Many stems for which the vowel has been determined by accented forms in CA lack the vowel in Kal. This pattern is probably more apparent than real because Vogt tends to consider the unaccented stem as primary. It is possible that in Kal the stem is less often accented than in CA, the tendency being to accent the suffix instead. Moreover, it seems as if Kal suffixes more often become thematic as a part of the stem. The following are illustrative: *otter* CA lıtkú, Kal ltku; *boy* CA asquqʷæsæʔᵊᵐ (qʷæs *foolish*), Kal sqʷs-eʔ (*son after puberty*); *bind* CA læč', Kal lč'; *cut in two* CA χʷat, Kal χʷt (*cut short, crop*); *divide, separate* CA χʷaqʷ, Kal χʷqʷ; *drag, pull* CA cækʷ, Kal ckʷ; *draw a line* CA læp', Kal łp' (cp. CA łip' *make a stripe*); *dressed, ready, prepared* CA χæc, Kal χc; *pl. persons enter* CA næp, Kal np-ilš (Vogt has pilš); *escape* CA łaχ-p, łχ-up'; *far, distant* lækʷ, Kal lkʷ; hunt CA čiłíp, Kal čłip; *recall, remember* CA łukʷ', Kal łkʷ'; *scatter* CA paχʷ, Kal pqʷ'; *thick layer* CA pæł, Kal pł-il.

However, when stem forms with the accent are available, the vowels in some cases are determinable for Kal as in *tell lies* CA y'aqʷ, Kal yəqʷ; *perforate* CA læxʷ, Kal ləxʷ; *clean, sweep* CA xʷækʷ', Kal xukʷ'; *one lies* CA ťækʷ', Kal ťukʷ'; *push* CA p'ic', Kal p'ac.

The importance of ə and its relation to consonant clustering is shown by the comparison of CA and Kal. In CA the sibilants, s and č, may be clustered with the nasals m and n; in Kal they may not. Vogt had this problem in mind and his recordings are reliable as evidenced by some of his examples from Spokan and Colville: *grizzly bear* CA smaχíʔıčn', səmaxéʔičən', Col səmxéʔikən'; *mountain* Kal esəmə́qʷ', Spok esəmə́qʷ', Col cəmaqʷ'; *nasal mucus* CA snəs, Kal sənəs (n is stem initial); *salmon* CA smılíč, Kal səmlíč; *smoke* CA smaʔʔt, Kal səm'ət; *snow* CA smikʷ't, Kal səmeqʷ'ət, Spok smaqʷ't; Col səmiqʷət; *spear* CA smúlmən, Kal səmúl'əmən; *tobacco* smil'xʷ, Kal səmen'xʷ, Col səmæn'xʷ; *woman* smíy'æm, Kal səmə́m.

In CA s-hın- *in* > sn- or sın-, but s-n- *in* seems always in Kal to become sən-.

Since all our authors, different as they are, mention and treat to some extent the presence or absence of ə, it seems that it should be retained and its relation to vowels with timbre determined.[6]

The relation of a, æ, to ə, u, and of u to ə will be discussed with labialization in **9.1.5**, below.

9.1.3. Vowel lengthening has already been noted as nonmorphological in Coeur d'Alene. It seems to have more than one function in Kalispel: vowels are sometimes lengthened to denote consonant loss; possibly this device takes the place of the echo vowel in CA or it may be the same phenomenon.

[5] IJAL 4. 127ff. (1927).

[6] Cp. Swadesh, Salish Phonologic Geography, Lg 28.237–9 (1952).

The following Kal vowel changes with duration may be related to the Till process which reduplicates for frequentative by using the initial stem consonant with i no matter what the stem vowel may be, and sometimes the reduplication has the form Ci-. Possibly the lengthened vowel in Kal indicates more than one function at the same time; plural and frequentative, or plural diminutive, for example. The vowel changes of Kal are u > a·; e, ɔ > i·; i > u·: s-sa·l-úse? *hail* (sul *cold*; ʔuʔúseʔ *egg*); s-ti·-tə-ʔéʔuti? *the younger of two brothers*; p'i·-p'ui-šən *automobile* (p'ui *wrinkled*; -šən *foot*; cp. ɬ-p'úʔ-p'uʔi-šən *toy auto*); ɬ-ti·-təw'ít *young men* (cp. ɬ-tətw'ít *young man*); t̓i·-túxʷ-tən *aeroplane* (t̓uxʷ *one flies*; in this example the rule of deglottalization seems to be reversed, the reduplicated t̓i·- deglottalizes the stem initial t̓); p'i·-p'ɔx̣-út *they are old* (cp. p'ɔx̣-pɔx̣-út *he is old*; p'ɔx̣-út *parent*; ɔ is probably from u, lowered because of p', x̣ or both).

The following example shows change from stem vowel e to u·, possibly related to Till where any stem vowel is reduplicated by becoming u, sometimes u·, for diminutive: es-pu·-pé-ulš *so that he can breathe a little* (the context seems to justify the diminutive).

Kal has a few stems with long vowels, sometimes of the form CV·C, sometimes CV̆VC; they will be discussed below.

Duration is apparent as a problem of Till (p. 12), Cheh (vocabulary and examples in text), S-D (pp. 10–1), and Comox (pp. 3ff), but its significance is so far undetermined.

The short accented vowel is probably as important as the long one. Few short vowels are accented in CA. Usually accent is the test of a strong vowel in these languages. In Till, Cheh, S-D and Comox a short vowel or ɔ may be accented as well as a long one. This is a problem of the Coast languages rather than of CA or Kal.

9.1.4. None of the languages compared here has pitch accent, and it has not been mentioned as morphological for Salish, although it is significant in other languages of the Northwest, Quileute and Haida, for example. Three patterns of accentuation emerge for the five languages here compared. 1. The accent falls on the stem, sometimes with weakening of suffix vowels (S-D, CA, Kal); sometimes with change of a suffix vowel (Till, Cheh, S-D). 2. The accent falls on the pronominal suffix (Till, Cheh, Kal, rarely in CA). 3. The accent falls on the non-pronominal suffix (all). In CA it has been demonstrated that all accent patterns indicate a difference in meaning. (In Comox the accent shifts as a process of reduplication—different from the other languages—but the examples of nominal-locative suffixes are too few to indicate whether or not the stress changes.)

Whereas in CA and Kal the shift of accent to the stem may weaken unstressed vowels, in Till, Cheh, S-D and Kal unstressed vowels are sometimes strengthened, and stressed vowels are often weak.

Vogt's examples seem to show that the relation of vowel strength and accent in Kal is comparable to CA. He distinguishes all strong vowels, even in monosyllabic words, by accenting them, but this device does not mean that stems in the lexicon are invariably accented. Unfortunately he did not secure meanings for many oppositions where accent is the only difference. The following are the only examples: squʔúɬ *dust*; squʔuɬ *yellow jacket*; skʷá·lšən *crane*, skʷa·lšín *sandhill crane*.

A few of the stems have two forms CV·C and CV̆VC, not all of which are corroborated by the examples given: p'a·p *be on fire*, la·p *paddle*, *row*, t̓a·p *shoot* have examples of both forms, p'aáp, laáp, t̓aáp; and t̓i·p *drop*, *fall*, *rain* has the form t̓eíp as well. The last is suggestive; probably all stems of these forms are composed of CV plus a thematic suffix -VC, in this case -ip *bottom*(*down*) < -ep, -ap. The more usual Kal suffix -ap is compatible with the vowels of p'a-, la-, and t̓a-, whence p'a-ap > p'a·p, etc., but t̓e-íp survives as incompatible

when i is accented, but compatible when it is not.

All the other stems cited are given with the form CVV̀C, but strangely enough, the examples have CV·C only. Some have CA cognates in r, and as we have explained the long vowel indicates a consonant change or loss: *animal swims* CA č'ar, Kal č'a·l (listed č'aál); *unwrap, untie* CA tar, Kal ta·l (listed taál); *tease* he·t (listed heét); *slip* CA ɬaɻʷ (*slippery*), Kal lɔ· (listed lɔ́); *tie* CA Ræc, Kal a·c (listed aac); *lose, disappear* CA Rus, Kal ɔ́s (in all examples); *fox* CA sχʷéɸʷ-χʷæɸʷ, Kal χʷa·-χʷáa, Spokan sxɔ·xɔ́.

Kal caá *dog barks* (*holler*) is to be compared with CA caR *scream with pain*, and cɔ́(š) with CA c'aɻʷ *scream from temper*. The same line of reasoning applies to *be absent* CA č'uᵘ, Kal č'úu, č'u·, in which the double or long vowel of Kal shows the vestige of w retained by CA in ᵘ. The next example, *pull out resistant object* (*as a nail*) CA caw'q, Kal cɔ·q (cɔ́q) seems to be similarly related.

It seems evident therefore that in Kal duration, at least to some extent, indicates contraction, and that stress is important in determining whether an accented suffix retains its identity in the form CVV̀C or whether some sound, determinable by comparison of several languages, survives in a much disguised form.

Generally in CA stress does not fall on pronominal suffixes, whereas in Cheh and Kal a whole class of verbs requires the accent on these suffixes. The few cases in which this type of accent occurs in CA may doubtless be accounted for by borrowing or survival. Even in some of these there is a difference in meaning: æt̓uχʷstɬɬt *we are customarily beaten*, but aᵃ-t̓éχʷstælɬt *we are customarily killed*.

In one class of Kal verbs the accent falls on the pronominal suffix or suffix complex, contrasting with a second class in which the stem vowel or a non-pronominal suffix vowel is stressed.

The Till examples dácχæc *he passed me*, and dácχɛ́ec *he passed you*, suggest that accent is significant.

9.1.5. Throughout this comparison the instability of labials—vowels and consonants—has been apparent. The fluctuation is a major problem of any Salish language and must be determined for the relationship of vowels to one another, of consonants to one another, and of vowels and consonants within a single language. This suggestion may be illustrated for CA and Kal, but as soon as other languages are attacked, the result is suggestion rather than conclusion. The following suggestions are offered, arrived at through hints in the languages for which these relationships have not been worked out.

Outstanding internal vowel changes in CA are a, æ > i, i > a, æ. Under the influence of labials, however, CA æ > ɔ, u (*look for* æxus, uxas, ɔxʊs); and u > æ (*ten* upən, æpʊn). Changes of this kind are few, to be sure, compared with CA u > ɔ > ʊ: which are more usual, but they suggest that the relation of æ and i is very different from æ in its relation to u and ɔ. Some of these relationships may be exemplified by comparison with other languages.

CA u > Kal i: *condition within a subject has become a part of it* CA uᵘ-, Kal i-; *there, near him* CA ɬuʔᵘ, Kal ɬiʔé.

CA i > Kal u: *daughter, girl* CA šɪ-šíw't, Kal (ɬ)še-šútəm' (these are comparable because both are diminutives); and possibly, *one flies* CA tiʔᵘɬ, Kal t̓uxʷ.

CA u > Kal e (ɛ): *again, back* CA uɬ-, Kal eɬ-; *ground, earth* CA -ul'umxʷ, Kal -uleʔxʷ.

The relation of Till a and i is indicated by the following changes within the language: *summer* qa·húš, qiəháwuš; *be fat* q'auc, q'iuc, q'iᵘχ (cp. *body, flesh, meat* CA qiltč, Kal sqeltč); *cold* xaal, xial; *fear* xaš, xʷayaš; *hide* yahg, ihig.

Till a > u: *bottom* -uh, -ah, -aha; *surface inside* -ic'a, -æcu.

Till i > u: *four* wis, wu·s; *cause* -wi, -wu;

cross water giẓ, guẓ; *concentrated food* -iɬ, -uɬ; *eye, fire, face* -is, -us, -ais, -æis.

It is impossible to determine whether these are changes due to the position of elements in relation to neighboring sounds, but there is some indication that at least some vowel changes are morphological; -i- of a reduplicated stem indicates frequentative; -u- of a reduplicated stem indicates diminutive but there are other changes not accounted for which may be grammatical.

Apparently there is a palatalizing process, fully carried out in the examples above, but merely suggested in: *bleed* kyaw, ki·wu; *water* qæu, qʸæu.

An interesting change is the Cheh *wife* kʸoəɬ or čawɬ; č > kʸ, but the rounded vowel is retained with palatalized kʸ.

Since the vowel changes from language to language are sporadic, the following comparison of words or elements containing the sounds of interest in this connection brings out the points discussed as well as others. The list is arranged alphabetically in English, and the English word will be used for reference to the list.

About CA -ælwis, Kal -luis, -elis, -əlis; *ask for* CA sigw, Kal seu, sew, Till yæ-sgay, Cheh sa·w; *baby* CA gu-gwaẋ-tɬ'l't, Kal ɬ-oxté(-lt), Till ġaakaɬ, ġaqha·ɬ, Cheh s-qʷayá·il, qʷá·il; *bark* (*of dog*) CA wih, Kal uh(-em), Till wah(-an); *between, middle* CA -iw'æs, Kal -eus, -eʔus, Till -gas; *bite, gnaw, chew* CA kʷ'iʔˡ, Kal kʷ'eʔ, Till č'ig(-iu), Cheh kʷ'ay, S-D kʷ'aʔ; *borrow* CA kuɬ, Kal kuɬ, Till čiɬ, Cheh čo·yaʔ; *bury* CA læq', Kal laq', Till liq'.

Call by name Kal au, Cheh u·m, o·mat; *carry* CA ukʷ, Kal ʔukʷ, Till aaha, Cheh e·xʷ; *cause* CA -im, Kal -am, -um, -əm, Till -wi, -wu; *cavity* CA -gwil, Kal -eul, Till -gi·l, -ʔækɬ; *dig out with a stick* CA gwic', Till ga·c'-i, S-D wic'; *dive* CA us(-ulš), Kal ʔus, Cheh i·soʔ (*sink*); *drip* CA Raw, Kal au, Till ẓa-guš, Cheh apxʷ.

Fat CA q'uc, Kal q'uc, Till q'auc, q'iuc, q'iᵘẓ, S-D xʷo·s; *fear* CA ẋiɬ, Kal ẋeɬ, Till ẋaš, xʷayæš; *four* CA mus, Kal mus, Till wis, wu·s, Cheh mo·s, S-D bəbos; *good* CA ẋæs, Kal ẋes, Till hut.sn, S-D xaɬ; *go out* CA acqæʔᵐ, Kal ʔɔcqeʔ, Till usqæ; *go, pl.* CA daẋ(-t), Till tiit, tiut, Cheh wakʷ; *go, s.* CA xui, Kal xui, Till ẋʷaɬ, ẋal, Cheh wakʷ, S-D ʔoxʷ.

Hand CA sc'íy'æčt, Kal čellš, Till čaláš, Cheh čalš, kálix, S-D, čaleš; *head* CA -qin, -qən, Kal -qin, Till -qa·n, Cheh (-als, -lis), S-D -q'əd; *heart* CA -ilgwæs, Kal -els, Till -aligas; *hide,* (v.) CA Rip(ulš), Till yahg, ihig, Cheh i·pxʷ; *high* CA gwis, Kal uis, Till gis, gus.

Oar Till ẋæu(t), Cheh ẋo·mt; *parent* CA pípæʔᵐ (*father*), Kal poẋút, Cheh sẋal; *red* CA kʷol (*be red*), kʷil (*become red*), Kal kʷil, Till kaal, Cheh qʷil, S-D kʷeẍ, kʷal (*paint*); *road* CA nšégwæl, Kal šuʔšuw'él, Till šigáɬ, šóga·l, Cheh šawɬ (*marmot trail*).

See CA gwič, Kal wič, S-D gwač (*look for*); *seven* CA cúnčtəm, Kal sisp'əl', Till tč'us, Cheh c'ɔps, S-D cokʷoks; *smoke,* (n.) CA smóʔət, Kal səm'ət, Till shúli·l; *tail* CA sč-sups-ən, Kal sups, Till suhs, Cheh so·ps-ónč; *take small obj. s.* CA kʷin, Kal kʷen, Cheh ķʷan; *talk* CA qʷaʔˢqʷæʔᵐl, Kal qʷəlqʷel, Till ġæləẋ, Cheh xauq', S-D xod; *ten* CA úpən, Kal ʔupən, Till aha·nčs, Cheh pá·načs, S-D padadác; *turn over* CA p'ælč' (*one flat obj.*), p'ilč' (*pl. round obj.*), Kal p'əlč' (*turn back*), Till hul, Cheh p'əlč; *water* CA síkʷæʔᵐ, Kal séułkʷ (*river, lake*), Till qæu, qiu, qʸæu, Cheh qa', qaᵃ', S-D qoʔ.

CA a > Kal e > Till æ > Cheh a > S-D o: *talk*; CA a > Kal e > Cheh, S-D a: *good, hand*; CA a > Kal ɔ > Till u: *go out*; CA æ > Kal a > Till i: *bury*; CA æ or i > Till a > Cheh ɔ: *turn over*; CA æ > Kal u > Cheh a: *road*; CA i > Kal a > Till i, u: *cause*; CA i > Kal e > Till a or Ø > Cheh a > S-D ɔ: *ask for, fear* (Till a), *go, s.* (xu > xʷ), *take one small object*; CA i > Kal e > Till ɨ > Cheh, S-D a: *bite*; CA i > Kal i > Till a > Cheh i: *head, hide*; CA i > Kal i > S-D a: *see*; CA i > Kal i > Till i: *high*; CA i > Kal u > Till a > S-D i: *dog barks, dig out with stick*; CA u > Kal u > Till i(u) > Cheh S-D o: *four*; CA u > Kal

u > Till i > Cheh ɔ: *borrow*; CA u > Kal u > Till, Cheh, S-D a: *ten*; CA u > Kal u > Cheh i: *dive*.

It is often assumed that k^{w} and ku are the same, and that the rounded vowels ɔ, o or u 'naturally' follow a labialized consonant. In Salish examples may be found to corroborate the assumption, but the rule is by no means invariable. For instance, CA ku- or ku^{u} *P2 subject of the intransitive completive-customary aspect* becomes Kal k^{w}-; but Kal ku- is *first person object of the continuative*; all behave differently in combination.

More commonly, an initial labialized palatal becomes the palatal with u, for example, k^{w}, gw > ku, gu, respectively. The vowel may take an accent: CA æk^{w}n *tell, say*, but ækún *he said*; *hold, grasp one small object* CA k^{w}in, Kal kun.

There is likewise a theory that i 'normally' follows a palatalized consonant. In Salish comparison the relation between palatalization and labialization is demonstrated by the change CA gw > Kal w or o > Till g > Cheh w > S-D gw, w > Comox g^{y}, and these changes take place regardless of the following vowel: *ask for*; *baby* (in Cheh the word is probably not related to CA gwax but rather to q^{w}æs *foolish*, as in CA squq^{w}-ésɛ́?^{æ}); *cavity*; *dig out with stick*; *high*; cp. also *red* in which Kal, CA k^{w}il > Till kaal, and S-D retains k^{w} with a; and Till sqæxæ *dog*, sigyugyækyæxa *puppies*.

9.1.6. Glottalization, like reduplication and often a part of it, is a morphological process in Salish languages, but in no two we have compared is it used in exactly the same ways. In CA it may indicate contraction; it may express diminutive (reduplication), repetitive, distribution, derivation; and the glottal stop and glottalized consonants are basic in vocabulary.

In Kal a glottal stop may be used as a pluralizing device in the third person where the vowel of the stem or suffix is glottalized. Glottalization is a process used to express diminutive and other types of reduplication, and there is some indication that glottalization with an echo vowel (not indicated by Vogt) may preserve a trace of a contracted element.

Glottalization seems to be somewhat vague in Till and its function, if any, not worked out. In Cheh it is very definite, used for several purposes—pluralizing, and others not worked out which Boas calls 'irregular'. It does not seem to be morphological in S-D or Comox.

9.1.7. Contraction may be very instructive to a diachronic study. By 'contraction' is meant much more than the simple, obvious sound assimilations often referred to as 'sandhi.' One of the least disputed facts of linguistic knowledge is that slurring occurs in rapid speech, giving rise to habits which may become characteristic of an entire language. The kind and amount of slurring differs in each language. For it is an interesting fact that forms of Interior languages are not slurred in Coast languages, and therefore the Coast languages are very useful in the reconstruction of certain forms of great importance in the Interior.

An example is the phonetic effect of the pronominal subject and object suffixes of the languages here compared. Because at the time they were analyzed no comparable materials were available from the Coast languages, the CA pronominal suffixes were separated and reconstructed. Tweddell's study presents a system in which only a few forms are slightly contracted, so that the analysis of the CA forms may be corrected. Moreover, the fact that in Kal the first person objects are prefixes, whereas in CA they, as well as all others, objects and subjects, are suffixes, establishes certain conclusions because the subject suffixes can be isolated in Kal.

The echo vowel of CA, resulting from a combination of several elements is another example. Some CA consonants, as t, n, c, s (> y'), ɬ, and u (> uw') are glottalized before a vowel. This rule suggests that an initial vowel is preceded by a glottal stop.

As a matter of fact this is not true in CA or Kal, but may perhaps be found in some intermediate language for which we do not have this kind of detail.

Most glottal stops are accounted for as serving an independent phonetic purpose, as morphological devices, or as an indication of contractions. After analyzing CA there were a few that could not be satisfactorily explained. It is now clear that these may now be reduced to rule instead of being counted as 'irregular' forms. It has been established that many sounds behave the same way whether they are initial, medial, or final in some of these languages. I showed that CA continuative pronominal prefixes like čɪn-ɪn-s- > čin'is-, but overlooked the same process in suffixes -ən-ən > -ən', and -qən-ə́n > -qən'. The contraction of this type disposes of practically all glottalized n's otherwise considered irregular.

The position of the two suffixes -in (-ən) *attempt*, and -in(-ən) *transitivizer*, may in some cases be determined by the understanding of contraction. There is also reason to believe that vowel lengthening and change of accent perform similar functions in Kal, Cheh, and possibly in Till.

NOTES AND REVIEWS

WILLIAM THALBITZER

1873–1958

It is with great sorrow that the Editors report the death of Professor William Thalbitzer in Copenhagen on September 18, 1958.

Professor Thalbitzer was an associate editor of the International Journal of American Linguistics since its founding in 1917. In Denmark he was Professor in the University of Copenhagen and the founder and first director of the Phonetics Laboratory, University of Copenhagen, which later became the present Institute of Linguistics and Phonetics.

Thalbitzer published more than 300 papers and monographs, the bulk of them on the language and culture of the Greenlandic Eskimo. Outstanding among these are his Phonetical Study of the Eskimo Language (1914), Eskimo (a grammatical sketch, 1911), and his contributions (linguistic and ethnological) to four massive studies of the Ammassalik Eskimo (Meddelelser om Grønland, 1911, 1914, 1923, 1941). A bibliography of Thalbitzer's works (complete from 1900 to 1953) may be found in Meddelelser om Grønland, Bd. 140, nr. 1, 1954.

Thalbitzer's studies of the Eskimo are by no means confined to formal descriptive accounts of linguistic and cultural phenomena. His thorough command of the Eskimo language and his long personal experience with the Eskimo people gave him an insight and understanding of their ways of life that is only rarely achieved by Europeans or Americans who study nonliterate peoples. Scholars in both Europe and America will deeply regret the loss of so able a student.

STUDIES IN LINGUISTIC ANALYSIS. Special volume of the Philological Society. Oxford (Blackwell), 1957. 205 and vii.

ROBERT P. STOCKWELL

J. R. Firth's short introduction explaining why these studies were thought to belong together in a single volume does not carry much conviction, it being obvious that some belong in specialized journals whereas others are of general theoretical interest. The volume contains nine papers. The first three are general: A synopsis of linguistic theory, 1930–55, by Firth (1–32); Zero in linguistic description, by W. Haas (33–53); Some aspects of systematic description and comparison in grammatical analysis, by M. A. K. Halliday (54–67). The last six share only the fact that they are phonological studies on 'rather unfamiliar languages', as Firth so nicely puts it: Aspiration in the Hāṛautī nominal, by W. S. Allen (68–86); Vowel nasality in Sundanese. A phonological and grammatical study, by R. H. Robins (87–103); Junction in spoken Burmese, by R. K. Sprigg (104–38); Gemination in Tigrinya, by F. R. Palmer (139–48); Gemination in Hausa, by J. Carnochan (149–81); Long consonants in phonology and phonetics, by T. F. Mitchell (182–205).

Though a scholar of distinction and renown, Firth adds nothing to his reputation with his Synopsis. It appears to have been put together largely with scissors and paste, with long excerpts from his Speech (London, 1930), The Tongues of Men (London, 1937), The technique of semantics (TPS, 1935), Modes of meaning (Essays and Studies, 1951), and General linguistics and descriptive grammar (TPS, 1951). In spite of such claims as 'The present theory offers ... not only a theory of synthesis, but the possibility of a synthesis of the main advances made in the subject during the last thirty years' (22), I cannot see that Firth has here presented a theory at all, even in outline. I take the word 'theory' to mean some kind of model to account for the structure of observed phenomena:

Chomsky, for instance, has a theory in this sense; so does Trager, and no doubt many others, including Firth—but a reader cannot discover the shape of it from this paper. This is not to suggest that he does not have challenging things to say about linguistic theory. To sample a few: 'No attempts seem ever to have been made to distinguish philosophical time (and space), clock time, calendrical time, solar time, personal and situational time from what should properly be called *grammatical time*' (19).[1] 'No valid theory of the morpheme built on the phoneme has yet been framed' (14).[2] In general, American structural linguistics does not come off well in Firth's view: '[It] ... has not furnished any valid grammatical analysis of any language by means of which renewal of connection in experience can be made with systematic certainty' (21–2). I don't know what this means.

Perhaps the most curious thing in Firth's synopsis is his conviction that meaning is not a problem requiring different analytical techniques from those that are already available: 'The meaning of language can be stated in linguistic terms if the problem is dispersed by analysis at a series of congruent levels' (29). The problem is unfortunately not so easily 'dispersed'. Several different groups of American linguists have set up elaborate levels analyses—levels which do not represent merely units of increasing size, as some have thought. All levels arrangements reflect in one way or another the fact that utterances are capable of differing from one another in two ways, and a derived third: (1) in the selection of units; (2) in the order of units; and (3) in the constituency relations among the units. The third is derived from 1 and 2 in that differences of constituency, if marked at all, are marked by the occurrence of additional (often prosodic) units or by differences in the order of the prosodic units; whenever two or more constituency arrangements each constitute a significant sequence and the constituency is not marked in some way, the utterance must be grammatically ambiguous because it has at least two trees of derivation (thus Joos's famous example, 'Take the big one upstairs'). In Chomsky's kind of syntax, constituency relations are automatic products of the techniques by which phrase structure and transformational structure are stated. But no amount of 'dispersal', whether into units, profiles, and systems (1, 2, and 3 above, in Trager's terms, formerly isolates, sets, and patterns), into phrase structure and transformations (Chomsky), or into structures, systems, exponents and the other terms that Firth uses freely in meanings that are far from clear but that seem to refer to levels of some kind—none of these accounts for more than the formal structure of grammatical sequences. The problem of meaning is a different kind of problem, namely synonymy,[3] and while there is still hope that distributional analysis may substantially reduce the measure of intuition that goes into lexicographical work, to suggest that the problem of meaning can be dispersed through many levels and thereby handled is to oversimplify the matter.

Of the three general articles, Haas's on Zero in linguistic description is the most significant contribution. The book would be worth the price of admission for this one essay. It is clearly, forcefully, and unambiguously written (in this book, a unique virtue), besides being so thorough and exacting in its treatment of zero as to carry

[1] Such an attempt has, in fact, been made in a monograph by William E. Bull entitled Time, Tense and the Verb, soon to appear from the University of California Press.

[2] A. A. Hill, in Introduction to Linguistic Structures (1958), has attempted to assign morph boundaries by partially phonological criteria, but his criteria do not suggest that anyone even wants to build a theory of the morpheme on the phoneme.

[3] See W. V. O. Quine's The problem of meaning in linguistics, in From a Logical Point of View (Cambridge, 1953).

full conviction. 'It is the aim of Linguistic Analysis to correlate semantic differences with phonological: to *locate* differences between the meanings of whole utterances in particular differences between their phonological forms (35).' 'There must be something amiss with a method of analysis that allows us to replace perceptible distinctions by imperceptible ones (37)', as in Bloch's analysis of *took* as *take* + *O* (English verb inflection, Lg. 23.399–418 [1947]). Haas argues that the alternation rule ('One of the alternants of a given morpheme may be zero; but no morpheme has zero as its only alternant' [Bloch, op. cit., §2.3]) is a necessary but insufficient condition for zero as an element, because it would be 'much more plausible to say, *against* the rule, that *cat* and *cats* contrast as zero contrasts with *-s*, than to say, *with* the rule, that *man* and *men* contrast as the absence of zero contrasts with its presence!' (38). 'A zero element must be identifiable *in its own environment*' (39), since otherwise 'zero is established only to be declared redundant' (39); 'if we are supposed to know of the presence of a zero morph, such as zero "past", *only* by the presence of another and overt morph, such as *went*, then a morphemic value ("past"), having been denied to the overt morph (*went*), is in fact re-assigned to it' (39).

Haas sets up two conditions for the establishment of a linguistic element: (1) '[It] . . . must have a *form* of its own, identifiable as "the same" in different environments, and (2) it must have *distinctive value*, i.e., contrast with others, in some of its environments' (41). Zero, of course, is 'devoid of any acoustic shape whatever' (41), and so 'is identifiable *only by its distinctive value* (41).' 'Distinctive value [for zero] . . . consists in *the omission of some determinate form or forms other than zero*. . . .' [Zero] 'is some determinate segment (or a class of such) *not* supplied. It is an *operation* performed on overt forms' (42). 'What distinguishes zero or order from other elements, is that *their very form consists in relations*: the form of order in syntagmatic, the form of zero in paradigmatic relations' (43).

Haas gets to the core of his argument below:

> In order to understand the 'zero'-operation of omission, it is necessary to realize the nature of the essential contrast. The contrast, here, between the presence and absence of an overt form cannot be said to lie between (a) the form and (b) the operation of omitting it . . . . The contrast lies *between two operations*: that, namely, of 'putting' or 'choosing' a form, and that of 'omitting' or 'rejecting' it . . . . What, without much thought, we commonly refer to as the 'occurrence' of a form, or what, with slightly more thought, we call its 'distinctive occurrence' or 'privilege of occurrence', is laid open as, in truth, an operation, an act of choice. Speaking a language is picking one's way through a succession of choices. The contrastive occurrence of an element is the selection of it from amongst the members of a substitution class . . . . What the fundamental linguistic notions of 'substitution' and 'distinctive value' refer to is, in fact, nothing other than this operation of choice. (43)

Haas then goes on to point out that choosing and rejecting are usually present jointly, one form being chosen, others rejected. But with zero-elements, 'we have the choice between choosing an element and rejecting it; the operations of choice and omission, usually unrecognized in their non-contrastive universality, are here raised to the level of distinctive elements' (43). Thus he sets up, as a necessary criterion for the establishment of a zero-morph, 'the distinctive omission of some determinate form or forms other than zero' (45), which he calls 'contrastive omission'. Thus such proposed zero-suffixes as past for *went*, *took*, plural for *sheep*, *geese* 'are all disqualified on the ground that they are incapable of contrasting with overt expansions of the forms to which they are bound' (45). But contrastively omitted morphs (zero-morphs) must still 'have a morphemic value which is shared by morphs other than zero'—i.e., have overt alternates. Otherwise it would be

impossible 'to decide *what kind* of expansion may be considered to contrast, not merely with its absence but with an element zero' (46). It follows that there are no zero phonological elements, since 'phonemic features are positive and overt elements' (49). Only a morph can fulfil the conditions of distinctive omission and overt alternants, 'by *contrast* with an overt morph which occurs in some *common* environments, as well as *synonymity* with an overt morph which occurs in different environments' (49).

These conclusions do not invalidate the use of zero 'by generalization only' as a class-index: i.e., as a convenient way of stating that *sheep* belongs both to the class of singular nouns and to that of plural nouns, the latter being predominantly bi-morphic. *Went* 'belongs to the *class* of preterite verbs, but it has no preterite suffix' (52). 'The symbol "0" conveys that a suffix which is characteristic of other members of the class is missing here' (52). 'The class index zero, so far from indicating a zero-element, only marks a morph as being classed with bi-morphic expressions' (52).

If I have quoted extensively from Haas's contribution to this volume, it is because I think the study is very nearly definitive as regards the theory of zero-elements, deserving to be read widely. In transformational grammar, however, zero becomes simply an element in a formula which can undergo transformations: it more nearly resembles a mathematical zero, and performs the same function—to allow for the manipulation of an empty digit. Thus Chomsky's interrogative transformation applied to the string

the boys—present—smoke cigarettes

(in which 'present' is ø) yields, by the rule

$$X_1—X_2—X_3——X_2—X_1—X_3$$

the string

present—the boys—smoke cigarettes

which by obligatory transformations and morphophonemic rules eventually yields (in phonemic transcription)

Do the boys smoke cigarettes?

Concerning this use of zero, Haas's remarks have no meaning, because he is concerned with zero only as a member of a class: his criteria evaluate the conditions under which it is legitimate to classify zero as a morph, i.e. when it properly belongs in the inventory of class membership.

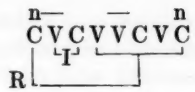
Halliday's study is lightweight by comparison, though it is clear and useful. It sorts out, once again, the synchronic—diachronic distinctions, and the comparative—evolutionary ones, and calls attention to some of the problems that result from differences between the structure and categories of the language under description and those of the language of description.

So much for the general studies. The specific language studies must be treated briefly here, if only because of my ignorance of these languages. Allen's work on Hāṛautī (Rājasthānī) is, I think, stated in a fashion that is extraordinarily complex even among linguistic publications. If I understand him at all, he has devised a description that allots aspiration to a prosodic level and thereby simplifies the morphophonemic statements of alternation that would be required in an analysis that kept aspiration on the segmental level.

Robins' study of vowel nasality in Sundanese is oriented like Allen's, but it has the considerable advantage that it cites many examples so that a reader stands some chance of following the argument (Allen cites some six examples, all in footnotes). The problem is that since vowel nasality is phonologically predictable in most instances, may it not be legitimate to predict the minority instances (where nasality is not phonologically predictable) by the use of grammatical information? Thus, for instance, if *n* is abstracted as a prosodic feature, its domain extends up to a following supraglottally articulated consonant. But

the domain is not broken by such a consonant if the consonant belongs to an infix. Thus [ŋūliat] 'to stretch' but [ŋālaūr] 'to say (pl)' (root [ŋāūr] 'to say'), the latter with 'disjoined' nasality. Robins' solution is to reject nasality as phonemic (either a single phoneme or a set of nasal vowels), because 'the vastly greater part of [the nasal phoneme's] occurrences [would be] predictable' (96). Instead, he sets up 'a word prosody of nasalization, *n*, entering into different sets of relations according to the phonological and grammatical structure of the words to which it is applicable' (96). Thus the phonetic data cannot be recovered from his transcription without the application of grammatical knowledge. No doubt his solution is an elegant one from certain points of view: it substantially unclutters his transcription. But the debate that Pike and others engaged in some years ago has certainly come full circle: not only are grammatical facts allowed as prerequisites that are built into the techniques of phonological analysis, they are now to be part of the set of rules by which phonetic data are recovered from a transcription. But, after all, the purpose of phonemic transcription is to represent all formal differences that are audibly distinct; an infix is not audibly distinct from any root syllable of identical phonetic shape. The grammatical knowledge that it is an infix rather than part of the root therefore cannot be used among the rules that link the phonemic abstraction to the phonetic continuum.

There is, nonetheless, a relatively simple solution to Robins' problem, within his own terms. I cannot see why he does not simply allow that *n* occurs TWICE in items like [ŋālaūr], though still only once in [ŋāūr]. This is not the same as setting up a phoneme of nasality, since *n* operates prosodically over several syllables. He allows several focal points for *n*: thus [māroēkɣn] 'to dry (pl)' has the structural formula



Apparently he allows only as many prosodic *n*'s as there are nasal consonants to initiate *n*. If so, then, of course, there need be no *n* occurring as a prosodic feature anywhere except in the very syllables to which he would deny the privilege of *n* occurrence. In all syllables but these, *n* is wholly redundant. The simplest solution of all, then, is the strict phonemic one which does not seem to have occurred to Robins: a phoneme of nasality that may occur only with vowels that do not stand in a position where nasality is environmentally predictable. There is no very good reason why a given phone, say, a nasalized vowel, cannot be assigned phonemically to V in the environment of N, but to $\overset{n}{V}$ in other environments. If the distributions are not identical, then phonetic similarity is not binding.

Sprigg, in his study of junction (juncture) in Burmese, states clearly for the first time in this book what the presumed advantages of the Prosodic Approach (always capitalized, curiously) are: (1) 'that the Prosodic Approach disposes of the need to make use of the suspect concept of assimilation; (2) that it further renders possible the symbolization of a given lexical item by a single phonological formula . . ., (3) that the resulting emphasis on the unity of the word suggests the possibility of stating tonal systems for the word rather than the syllable . . .' (106). Of these three, I am not clear (1) why assimilation is suspect (if treated as a matter of permitted distribution of segmental sequences), (2) why a morphophonemic transcription would not even MORE neatly permit a single formula for a given lexical item, or (3) why the statement of tonal systems for the word rather than the syllable cannot also be done more easily in morphophonemic terms. The advantage cited for (3) is that it bypasses 'the need to

classify particles tonally' (106). But leaving the prosodic approach quite aside, we can acknowledge that Sprigg's handling of juncture itself is both familiar in outline and remarkably exhaustive in detail. His 'intraverbal junction' acts pretty much like 'plus juncture' as described for English, German, Spanish; his 'interverbal junction' has features of terminal junctures, though he seems to have only one such.

The last three studies (Palmer on gemination in Tigrinya, Carnochan on gemination in Hausa, and Mitchell on long consonants in phonology and phonetics—illustrated from Bedouin Arabic) share a concern about the question of the phonemic status of long consonants. They make it clear that a decision to transcribe length in consonants (either by doubling the consonant or otherwise) can not be made on phonetic grounds. From a phonological point of view the decision always emerges from the function of the consonants in morphology: that is, the decision is dictated by morphophonemic simplicity. I find their ways of formulating the problem excessively complex, and I seem always to be stumbling around in their data trying to unscramble phonetic from phonemic from morphophonemic symbolizations (the simple elegance of virgules vs. brackets is altogether missing from these three articles, and rarely found elsewhere in the book).

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INTERROGATIVE STRUCTURES OF AMERICAN ENGLISH (THE DIRECT QUESTION). By Dwight L. Bolinger. Publication of the American Dialect Society, No. 28 (November 1957), viii + 184 pages.

PAUL SCHACHTER

Like the *sentence* and the *word*, the *question* is a part of our terminological inheritance, one of the categories bequeathed us by a prescientific linguistics. A scientific linguistics should ask itself, then, whether the bequest is a mere white elephant, should decide whether or not the category is legitimate, the term a useful one. In the case of the *question* no such decision has been forthcoming. Instead, as Dwight L. Bolinger remarks in the opening sentence of the monograph under review, the *question* has remained 'an entity that is often assumed but seldom defined' (p. 1). Bolinger himself is not greatly alarmed by this state of affairs. He sees in it, in fact, the inevitable result of the nature of the beast. For the *question*, according to Bolinger, is not a linguistic category at all, but a psychological one. This psychological category he variously characterizes as 'an attitude, which might be called craving' (p. 4) and 'a behavior pattern' which 'is as real—but as hard to pin down—as other behavior patterns: aggressiveness, deference, anxiety, or embarrassment' (p. 5). Consequently Bolinger shuns the thankless task of defining the Q (abbreviation his), and, instead, chooses to 'isolate types that can be linguistically defined' (p. 5). Bolinger's classification of the types of Qs used in American English constitutes the body of his monograph, and a summary of the classification will constitute the body of the present review. Before turning to this summary, however, I should like briefly to reconsider the problem of defining the Q, and, especially, to reconsider the need for despairing, with Bolinger, of a solution to it.

At least one recent English grammar, that of Fries, does attempt to define the Q in purely linguistic terms.[1] Fries' definition is approximately as follows: the Q is a sentence that is regularly followed by an oral response other than the stereotype oral responses that follow greetings and calls. Fries, in other words, defines the Q as a sentence that regularly elicits an answer. The shortcomings of Fries' definition are twofold. In the first place, there are sen-

[1] Charles Carpenter Fries, The Structure of English (New York, 1952), pp. 42 ff.

tences that regularly elicit an answer (e.g., 'Tell me about it.') that Fries is unwilling to classify as Qs.[2] In the second place, there are sentences that some of us, at least, might call Qs (e.g., 'What's the use?') that are not usually answered. It is facts of this sort, presumably, that lead Bolinger to declare that 'for persons who demand rigorous definitions, the term *question* cannot be defined satisfactorily so as to include the types that they themselves would spontaneously identify as Qs' (p. 3)—or, one might add, so as to exclude types that would spontaneously be identified as non-Qs.

And yet Fries has, in fact, succeeded in stating objectively one of the criteria on the basis of which native-speaker identifications of Qs are made. To this Bolinger himself would doubtless agree; for, in listing what he calls the 'ingredients' of the Q (pp. 2–3), he gives first place to 'interrogative distribution'—i.e., the eliciting of answers. (The other ingredients are: 'interrogative syntax'; 'interrogative intonation'; and 'interrogative gesture.') But Bolinger correctly perceives that neither interrogative distribution nor any one of the other ingredients is uniformly criterial for what are identified as Qs. The inference about the nature of the Q that he draws from this perception, however, is by no means inescapable. For all that the evidence of the native-speaker identification of Qs points to is this: the term *question* is popularly, and inconsistently, used in at least two senses. On the one hand it is used to denote a *functional category* (sentences that elicit answers—the category specified by Fries) and on the other, to denote a *formal* one (sentences marked by interrogative syntax—e.g., auxiliary inversion—and/or interrogative intonation[3]). The solution that I would suggest to the problem of defining the Q, then, is rather like the solution that Trager and Smith have offered to the problem of defining the *word*. Trager and Smith cut the Gordian knot of definition by distinguishing in the inherited term *word* two linguistically definable entities, the *phonemic word* and the *morphemic word*.[4] Can we not, perhaps, cut another such knot by distinguishing two linguistically definable entities in the inherited term *question*: a *functional* entity and a *formal* one? The *functional* Q—an utterance that regularly elicits an answer—is a category that can probably be hypothesized for all languages. The *formal*—or marked—Q, on the other hand, may not have to be set up as an independent category in some languages (i.e., its distribution may completely coincide with that of the *functional* Q), and will, in any case, certainly differ in its features from one language to another. In languages like English, where the categories are not perfectly congruent, it is necessary to use the qualifying labels *functional* and *formal* only in those cases where the two categories do not coincide. Thus 'Where are you going?' can be called merely a Q. 'Tell me about it,' on the other hand, is a *functional* Q but not a *formal* Q, while 'What's the use?' is a *formal* Q but not a *functional* one. Such a distinction seems to account quite adequately for native-speaker identifications of Qs (as well as for native-speaker doubts about identification) without relying upon such inaccessible data as attitudes and behavior patterns.

Fortunately, Bolinger's failure to define the Q has not prevented him from making a

[2] Fries would call the sentence a *request*, on the basis of its eliciting an 'action' response: that is, 'telling' is a response to the *request* 'Tell me about it' just as 'doing' is a response to the *request* 'Do it.' Unfortunately, Fries offers no way of distinguishing oral 'actions' from other oral responses.

[3] I would prefer to follow the lead of Leonard Bloomfield in classifying meaningful features of intonation as 'taxemes of modulation,' and thus as part of syntax—Language (New York, 1933), pp. 163, 186.

[4] George L. Trager and Henry Lee Smith, Jr., An Outline of English Structure (Washington, D. C., 1957), pp. 50, 56 ff.

very thorough study of the types of Qs used in American English. In fact, in terms of the identification of types (if not, perhaps, of their classification), the study bids fair to being exhaustive. Certainly there is nothing like Bolinger's full-scale treatment of the Q to be found in any of the standard grammars of English. Curme, Kruisinga, and Palmer together present scarcely enough material on the Q for a single chapter, and such observations as they do make, while sometimes cogent, must be ferreted out from their hiding-places among observations on sundry other matters.[5] Jespersen offers a more integrated discussion, and the embryo of a typology not unlike Bolinger's[6]—but embryonic it certainly is. As for Fries, his remarks on the Q are largely confined to a single chapter, The Structural Patterns of Sentences,[7] a chapter which, quite rationally concentrating upon basic patterns, surveys the woods of structure but leaves the trees unnumbered.

Bolinger, then, is amply justified in characterizing his study as a description of practically virgin territory. Equally justified is his demurrer on the subject of methodology: 'I would like,' he writes, 'to call the enterprise *exploratory*, but fear to mislead those to whom the term refers to a tentative *methodology* rather than an examination, by whatever paths and conveyances one may utilize, of an unknown *field*. Too many of us write as if our first consideration were to avoid being caught in error rather than the necessarily—at first—faltering manipulation of unfamiliar data' (p. iii). If, therefore, methodology is the burden of some of the remarks that appear below, their aim is only to pave the way for a firmer manipulation of the data in the future, and certainly not to suggest that the avoidance of error ought to have been the first consideration in the past.

Bolinger's primary categorization of Qs (pp. 5–6) is a fourfold division said to be based upon distributional criteria—specifically, upon the kinds of answers Qs receive. The four kinds of answers distinguished are: assent-dissent (answer is, or may be replaced by, *yes* or *no*); selection (answer is one of two or more alternatives posed by Q); elaboration (answer elaborates upon a questioned point—Q contains interrogative word); continuation (answer is completive—category includes such Qs as 'His reason being?' or 'And John?'[8]). The four types of Qs that elicit these answers Bolinger calls, respectively: *yes-no*, *alternative*, *how-why*, and *complementary*. The first two are paired as *multiple-choice* Qs, the second two as *explanatory* Qs.

Now whatever the merits of the above categorization—and they are, I believe, considerable—the basis of the categorization remains rather obscure. If we are to be able to distinguish the four types of Qs when we come across them, we clearly need more information than is given us by the answers they elicit. Only the *yes-no* Q can generally be recognized by its answer alone.[9] Such an answer as 'Coffee,' on the other hand, may be elicited by the *alternative* Q 'Tea or coffee?', the *how-why* Q 'What'll you have?', or the *complementary* Q 'And to drink?'. A more reliable basis for identification is,

[5] My own ferreting has discovered the following references to the Q: George O. Curme, Syntax (Boston, 1931), pp. 1, 4, 199–200, 212, 248, 352–353; E. Kruisinga, A Handbook of Present-Day English, Part 2 (Utrecht, 1925), I, 280–282; III, 234, 255–256, 259, 338–339; Harold E. Palmer, A Grammar of Spoken English on a Strictly Phonetic Basis (New York, 1924), pp. 17–20, 121–122, 213–215, 220, 261–266.

[6] Otto Jespersen, A Modern English Grammar on Historical Principles, Part 5 (Copenhagen, 1940), pp. 480 ff.

[7] The Structure of English, pp. 142–172.

[8] If the distributional basis for the categorization is to be retained, even in part, 'continuation' might better be explained as a special instance of 'elaboration,' distinguishable from the elaborative category itself only by the absence of the interrogative work in the Q.

[9] Even here there is ambiguity. 'Yes' and 'no' are the normal answers to the Q 'Yes or no?' and perfectly appropriate answers to the Qs 'What did he say?' and 'And he said?'.

perhaps, to be found in the internal structure of the Qs themselves. Thus the *how-why* Q is less ambiguously identifiable by the presence of the interrogative word within it, in statable positions, than it is by the answer it receives. So with the *alternative* Q, identifiable by the presence of *or* in combination with the absence of terminal-rising intonation.[10] The *complementary* Q, while not recognizable from internal evidence, is always commutable with a *how-why* Q that is, and may be so identified; 'His reason being?' is, for example, commutable with 'His reason being what?', 'What was his reason?', etc. This leaves unidentifiable only the *yes-no* Q, which can be recognized on precisely this basis—i.e., through the process of elimination. The identification of Q-types on grounds of internal structure is, to be sure, far from infallible.[11] I suggest only that it is less fallible than their identification on distributional grounds.

In addition to the categorization outlined above, which Bolinger calls the 'primary distributional cut,' he offers several other ways of classifying Qs. These ways show a considerable range both with regard to the kinds of criteria used and with regard to the size and number of categories identified. Among the more general categorizations the one involving the distinction between *plain* and *pyramided* Qs may be cited as particularly viable, the one labelled *discursive* as particularly revealing of Bolinger's sometimes casual approach to problems of classification.

Pyramided Qs (pp. 86–93, 103–110, 148–156) are Qs like 'Does he like it, do you suppose?', in which the Q that is normally answered ('Does he like it?') is grammatically subordinate to one that is not. Qs that are not *pyramided* are *plain*. Typically, the grammatically subordinate Q in a *pyramided* Q is fronted. When this is not the case (e.g., 'Do you suppose he likes it?'), the Q is a *marginal pyramided* Q—'marginal' because, in structurally predictable instances, it is the superordinate rather than the subordinate Q that is normally answered. Bolinger, in an appendix (pp. 173–178), presents an exhaustive schematic analysis of the structural types of *pyramided* Qs, together with an indication of their relative likelihood of occurrence. The fact that the category lends itself to so concise a schematization is strong evidence of its validity.

The categorization of Qs that Bolinger calls *discursive* (pp. 8–9) is, like the primary categorization, based upon distribution. In this case, however, it is the preceding environment that determines the class to which the Q belongs. The first distributional cut falls between *repetitive* and *non-repetitive* Qs. Bolinger himself does not state the grounds for the distinction, but one possible formulation, relating the Q exclusively to the preceding environment, might be the following: *repetitive* Qs are those that repeat all or part of a preceding sentence; other Qs are *non-repetitive*. Bolinger, however, includes in the *repetitive* category *reclamatory* Qs, those that call for a repetition of a preceding utterance—e.g., 'What did you say?' with terminally rising intonation. Now clearly such a Q is in no way contingent upon the preceding environment, and would seem, at least in terms of the formulation suggested above, better classified as *non-repetitive*. The formulation, however, might better be revised so as to include the succeeding environment as well: i.e., *repetitive* Qs are those that repeat all or part of a preceding sentence, or those after which all or part of a preceding sentence is repeated. In any case, a revision of either the classification itself or of the classifying principle would seem to be necessary. Also necessary

[10] The proviso about intonation is necessary in order to exclude from the class such *yes-no* Qs as terminally-rising 'Was it John or Mary?'.

[11] One obvious problem is to be found in the case of such *yes-no* Qs as the second Q in the following exchange: 'Where are you going?' 'Where am I going?' 'Yes.' But the problem can probably be solved, at least in part, by specifying the intonation patterns permissible in Qs other than *yes-no*.

is some restriction that will exclude from the *repetitive* class Qs that, while repeating preceding matter, significantly add to it. For example, the Q 'He's going to the movies?' is *repetitive* after the statement 'He's going to the movies,' but not after the statement 'He's going.'

More fundamental, however, are the considerations raised by Bolinger's breakdown of *non-repetitive* Qs into *original* Qs, *initiating* Qs, *sequential* Qs, and *explicit* Qs. In a note on this breakdown (p. 11), Bolinger says: '*Original* is of course another way of saying *non-repetitive*. I name the discursive classes for convenience, not to conform to the logic of inclusion and exclusion. The latter applies to the classes and sub-classes of the primary cut.' This note is a frank statement of Bolinger's frequent practice as a taxonomist. It follows that what Bolinger, disregarding 'the logic of inclusion and exclusion,' often provides is not so much a classification as it is a nomenclature, a sort of terminological arsenal. Now if, in science, the gift of sorting things well has a certain understandable prestige, the gift of naming them well, which is perhaps still rarer, is certainly not to be despised. It is only necessary to keep the two gifts, and their products, distinct.

No such distinction, happily, need be made with regard to Bolinger's unprecedentedly thorough categorization of the structural types of English Qs, types that are both well named and well sorted.[12] A basic distinction is made between *auxiliary* Qs (Qs in which there is an auxiliary verb, or main verb *be*, before the subject—e.g., 'Is she a dancer?', 'Where does she dance?') and *assertive* Qs (Qs in which there is no verb before the subject—e.g., 'She's a dancer?', 'She dances where?'). In addition to the full types of *auxiliary* and *assertive* Qs, there are a number of partial types.[13] Partial *auxiliary* Qs either show auxiliary inversion themselves, or are uniquely expandable into Qs that do; the types include *vicarious* Qs, in which the auxiliary is the only verb (e.g., 'Would anybody?'), and *elliptical* Qs, in which the auxiliary verb—or main verb be—is omitted (e.g., 'Anybody like some candy?'). Partial *assertive* Qs do not contain auxiliary inversion and are not uniquely expandable into Qs that do; the types include *vicarious assertive* Qs (e.g., 'He will?') and *fragmentary* Qs, in which the Q is syntactically less than any of the other types (e.g., 'John?'). Both full and partial Qs, of all types, may be followed by a *tag*—that is, a standardized postposed Q consisting of auxiliary verb and personal pronoun, in that order (e.g., 'is it?' in 'It's raining, is it?'). All tagged Qs are *auxiliary* by definition. Bolinger gives a separate designation to the tagged variety of each of the structural types, and thus arrives at the following twelve-way classification (abbreviations are Bolinger's): *aux*, *tagaux*, *ellip*, *tagellip*, *vike*, *tagvike*, *sert*, *tagsert*, *servike*, *tagservike*, *frag*, and *tagfrag*.

There is, in addition, a thirteenth at table, the *potential* Q, that might, I feel, well be unseated. In the *potential* category Bolinger includes Qs that are 'hypothetical, attacking not merely the factuality but the potentiality (especially the acceptability or credibility) of what is inferred' (p. 65). The category is introduced particularly to account for such *how-why* Qs as 'Why say anything?', but it also includes *yes-no* Qs such as the Q in 'Go there? Never!'. Bolinger himself suggests (p. 66) that 'potential Qs might be regarded as ellip with implied modal auxiliary tag, e.g., . . . Break his word to his boss (can, could, should, might, ought he)?'. He objects, however, that '(1) normal ellip is not so vague, and (2) this does not take care of the ellipsis of *be*.' The objections do not seem insurmountable. The normal *ellip* 'See it (do, did, can you)?'

[12] No one citation will serve to locate Bolinger's descriptions and exemplifications of the types. Descriptions are scattered through chapters 5 and 6, pp. 23–83. Useful lists, containing examples of the several types, are to be found on pp. 24–25 and 124.

is itself rather vague. As for the ellipsis of *be*, I assume that what bothers Bolinger is the difference between such sequences as 'The soup too salty?' 'Yes.' and 'The soup too salty? Impossible!'. This difference can, I think, be adequately explained in terms of the *formal-functional* dichotomy suggested above, with Bolinger's potential category reclassified as a '*formal*-but-not-*functional*' subtype of *elliptical* Q.[14] The change would eliminate from the categorization the one type of Q that is not identifiable (or, at least, that Bolinger has not identified) on a purely structural basis.

One matter less specific to the Q proper remains to be discussed. This is Bolinger's brief but challenging treatment of intonation (pp. 13–16), a treatment that amounts to nothing less than a general theory of morphemic accent in English. The theory is presented somewhat hesitantly because, as Bolinger explains in a note (p. 16), the experiments that underlie it remain unpublished and incompletely analyzed. The following precis of the major tenets of the theory is, however, taken not only from the exposition found in the monograph under review, but from that found in a more recent paper as well,[15] with the latter given precedence in cases of disagreement. The theory, then—presented in Bolinger's own sords—embodies the following points: 'What we term *stress*, in reference not to the syllable (distinctive, phonemic) but to the utterance (contrastive, morphemic) is signalled primarily by pitch salience'[16] or 'salient turns of pitch'; these salient turns of pitch can be grouped 'around certain norms termed *pitch accents*'; three such accents have been tentatively identified—'Accent A in which the accented syllable is skipped down from . . . Accent B in which it is skipped up to or up from without being immediately skipped down from . . . Accent C, in which it is skipped or glided down to';[17] 'the pitch accents are *morphemes* and have generalized meanings'; 'each has numerous *allomorphs* . . . but the *allomorphs* are gradiently contrastive.'

So comprehensive a theory, with, thus far, so fragmentary a documentation, naturally raises quite a few Qs of its own. For example: (1) Are features other than 'salient turns of pitch' taken into account in locating the accented syllable? If not, which is the accented syllable in such a sentence as 'Nice doggie!' with a pitch drop from 'nice' to 'doggie'? Is it 'nice,' which is skipped down from (Accent A), or 'dog-,' which is skipped down to (Accent C)? And which is the accented syllable in 'John smokes?' with pitch rise from 'John' to 'smokes'? The nature of the accent is clear enough this time; since one syllable is skipped up from, the other skipped up to, either would have a B accent. But which actually does? (2) If an accented syllable is both skipped down to and skipped down from, is it Accent C or Accent A that is involved? If the syllable is both skipped down to and skipped up from, is it C or B? (3) How are monosyllabic utterances to be classified? Accent A is identified by the relation of the accented syllable to a subsequent syllable, Accent C by its relation to a preceding one, Accent B by its relation to either. But there is clearly some kind of accentual morpheme differentiating 'Yes?' from 'Yes.' (4) If, in answer to (3), the descriptions of the pitch accents are modified to include pitch changes within a syllable, 'gliding' will certainly have to assume a more prominent place in the

[13] 'A full Q comprises finite verb and complement, if any. A partial Q is less than this.'—Interrogative Structures, p. 25.

[14] It is interesting to observe that conventional punctuation often takes cognizance of the dichotomy. In 'The soup too salty!?', for example, the exclamation point shows the function of the sentence, the question mark its form.

[15] Dwight L. Bolinger, On Intensity as a Qualitative Improvement of Pitch Accent, Lingua, VII (March, 1958), 175–182.

[16] Interrogative Structures, p. 13. Subsequent quotations, except as noted, are from On Intensity . . ., 175.

[17] This quotation and the one that follows are from Interrogative Structures, p. 14.

accentual repertoire. Now since there is some change of pitch within and between practically all the syllables of a sentence, how will the syllable that bears the accent be discerned? how classified? (5) What are gradiently contrastive allomorphs? How do they differ from distinct morphemes? When the morphemes themselves cannot always be easily distinguished—see queries under (2) above—by what principle will pitch sequences that can be distinguished be grouped together?

It is to be hoped that Bolinger, who has certainly handled a great many questions, will have no trouble with those just raised.

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NEO-MELANESIAN AND GLOTTOCHRONOLOGY

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In a recent discussion of lexico-statistical dating, using material from the Romance languages,[1] J. A. Rea casts serious doubt upon the validity of the method: he finds that glottochronological techniques lead to a gross underestimation of the known dates of linguistic splitting in Romance. Data from another type of language hitherto uninvestigated glottochronologically, i.e. Pidgin English, suggest that lexico-statistics can on occasion give equally unrealistic results in the opposite direction.

I have taken the revised basic list of 100 words proposed by Swadesh[2] and have provided the corresponding forms in Neo-Melanesian (Melanesian Pidgin English),[3] in the order suggested by Swadesh in his Table 2 plus his eight new items.[4] The Neo-Melanesian forms are: 1. ɔlgeder, 2. æšɪs, 3. skɪn bɪlɔŋ diwaj, 4. bɛl, 5. bɪgfɛlə, 6. pɪğɪn, 7. kajkajɪm, 8. blækfɛlə, 9. blʊt, 10. bon, 11. bonɪm, 12. klawd, 13. kolfɛlə, 14. kəm, 15. daj, 16. dəg, 17. drɪŋk, 18. draj, 19. ir, 20. grawn, 21. kajkaj, 22. kiaw, 23. aj, 24. gris, 25. gras bɪlɔŋ pɪğɪn, 26. fajr, 27. fɪš, 28. flaj, 29. fʊt, 30. gɪvɪm, 31. gʊdfɛlə, 32. grinfɛlə, 33. gras bɪlɔŋ hɛd, 34. hæn, 35. hɛd, 36. hirɪm, 37. klak, 38. mi, 39. kɪlɪm, 40. save, 41. lif, 42. slip, 43. lɛwa, 44. lɔŋfɛlə, 45. laws, 46. mæn, 47. plɛnti, 48. abus, 49. mawntɛn, 50. maws, 51. nem, 52. nɛk, 53. nufɛlə, 54. najt, 55. nos, 56. no, 57. wənfɛlə, 58. mæn na meri, 59. ren, 60. rɛdfɛlə, 61. rod, 62. fʊt bɪlɔŋ diwaj, 63. wajtsæn, 64. lʊkɪm, 65. sid, 66. sɪndawn, 67. skɪn, 68. slip, 69. lɪklɪk, 70. smok, 71. sænəp, 72. star, 73. ston, 74. sən, 75. swɪm, 76. tel, 77. ɛm . . . lɔŋ hæf, 78. dɪs-fɛlə, 79. ju, 80. təŋ, 81. tit, 82. diwaj, 83. tufɛlə, 84. wɔkə-bawt, 85. hɔtfɛlə, 86. watər, 87. mifɛlə, 88. wɔnem, 89. wajtfɛlə, 90. husæt, 91. meri, 92. jɛlə, 93. tɔk, 94. mun, 95. rawnfɛlə, 96. fʊlɔp, 97. skru bɪlɔŋ lɛg, 98. kapər bɪlɔŋ fɪŋgər bɪlɔŋ lɛg, 99. kom, 100. susu.

Since we know, as a matter of historically attested fact, that Melanesian Pidgin English came into being in the first part of the nineteenth century and that the English of that period contained all the words used in Swadesh's basic list, we may take English as the point of departure (t_1) and Neo-Melanesian as the later stage (t_2), and do our figuring using Swadesh's formula: $t_2 = \log C \div \log r$. However, if it is objected that English ought to be considered, not an ancestor but a 'sister' language of Neo-Melanesian (as we probably would consider it if we had no documentation concerning the relationship of the two), we may figure the relationship according to Swadesh's formula for calculating divergence time: $t = \log C \div 2 \log r$. Our percentages of retention will differ according to the interpretation we place on eleven items: the eight phrases in nos. 3, 25, 33, 58, 62, 77, 97, 98; and the three single words in nos. 1,

[1] Concerning the Validity of Lexico-Statistics, IJAL 24.145–50 (1958). Cf. also Douglas Taylor's critique of Rea, Concerning the Validity of Some Translations, IJAL 25.70–1 (1959).

[2] IJAL 21.124 (1955).

[3] Material from F. Mihalic: Neo-Melanesian (Pidgin English) Dictionary and Grammar (Techny, 1957) and from my Melanesian Pidgin English: Grammar, Texts, Vocabulary (Baltimore, 1943).

[4] IJAL 21.124, 133–7 (1955).

TABLE I

	Total No. of items compared	No. of +	% of +	Millennia of Separation	
				Assuming linear dev't	Assuming cognate rel.
A. Omitting 8 phrases and 3 words	89	60	67	2.66	1.33
B. Omitting 8 phrases, counting 3 words as +	92	60	65	2.85	1.43
C. Omitting 8 phrases, counting 3 words as −	92	63	69	2.46	1.23
D. Counting 8 phrases and 3 words as −	100	60	60	3.39	1.69
E. Counting 8 phrases as −, and 3 words as +	100	63	63	3.06	1.53

84, 96. We may count the eight phrases as negative items, or may omit them;[5] the three single words may possibly be considered as related to the corresponding English words, or perhaps they should be counted negatively because they are not morphemically identical but actually come from other English words or phrases (altogether, walk about, full up). Depending on the way we count these items and on the formula we choose for calculating change or divergence, we get the results shown in Table I.[6]

[5] I see no objection to counting these phrases as negative, at least in figuring percentages on the assumption of linear continuity, since they simply tell us that the English form has disappeared and has been replaced by something else, whether a single morpheme or a phrase would seem to be irrelevant. However, in order to answer possible objections, I have figured the percentages both ways, counting the phrases as negative and also omitting the items involved.

[6] A quick count of the correspondences according to Swadesh's old list (IJAL 24.133–7 1955) shows 131 pluses, 76 minuses, and 13 that must be omitted because there is no corresponding term in Neo-Melanesian; this gives 63% retention. By Swadesh's old value for the constant of *r*, 79.7%, one obtains a figure of just over two millennia (2.07) for the assumption of linear descendance, or half that time for assumption of cognate relationship.

It will be seen that, no matter how we treat the relationship, the resultant figures (two to three millennia for direct descendance; between one and two millennia for cognate relationship) come out wildly divergent from what we know to be the actual length of time involved in the formation of Neo-Melanesian, not over a century and a half. It may be objected that Neo-Melanesian, being a pidgin (and an incipient creole) is not to be considered on the same plane as 'normal' languages, since its formation took place under special conditions more similar to those attending the construction of artificial languages than to those of gradual linguistic change. However, for most language families of the earth, we do not know their previous history, and have no way of knowing whether or not (especially in the case of apparently distantly related languages) a stage of pidginization and creolization may have entered into the process of differentiation. This would seem especially likely in certain regions of the earth, such as Melanesia, where it is suspected that pidginization may be 'endemic' as a linguistic behavior pattern; but who can tell whether similar processes may not have taken place elsewhere, in places and times no longer accessible to us by historical record?

This one brief study of the vocabulary of a pidgin language needs to be supplemented by analyses of the lexical relations of other languages which we know to be pidgins or creoles: e.g. the other varieties of Pidgin English; Taki-Taki and Gullah; Haitian and the other French-based creoles; Papiamentu; Chinook Jargon; etc. However, even from this single instance it would seem that the 'normal' rate of lexical replacement assumed for glottochronology is not valid in

case pidginization has intervened; and, since no one can tell whether this has been the case or not with languages whose previous history we do not know, the entire applicability of glottochronology to language families without documented history becomes doubtful.

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ON THE RATE OF MORPHEME DECAY IN ARABIC

D. H. HYMES

Glottochronology has raised to paramount interest the question of the rate of change in basic vocabulary. In a recent paper Alauddin Ismail Samarrai presents findings for Arabic which "suggest that instead of a rate-constant common to all languages, there may be a rate-constant for each family of languages."[1]

The question of a universal retention-rate is by no means resolved, but Mr. Samarrai's findings do not weigh against the possibility. Once an error of procedure is corrected, the results fit easily enough with those upon which Lees first based an estimation of retention-rate.[2]

Mr. Samarrai deals with Egyptian, Iraqi, and Jordanian in relation to Classical Arabic. He uses the 215-item list upon which Lees' work was based, except that he eliminates *at* and *not* ("cannot be translated properly into Arabic independently of the content of the sentence") and *berry* and *lake* ("depend upon geographical circumstances and definition; thus, they are not, properly speaking, culture-free in relation to Arabic"). The elapsed time between Classical Arabic and the modern dialects is assumed to be about 1.25 millenia. Following the formulations of Lees, the fraction of basic vocabulary retained per millenium is found in terms of $N = N_o e^{-\lambda t}$, where N_o = number of morphemes at time t_o, N (N_1) = number of morphemes retained at a later time (A.D. 1958), $e = 2.718$, and $\lambda(k)$ = the retention rate. The results are:

	N_o	N_1	t	k
Egyptian	211	183	1.25	0.8923
Iraqi	211	188	1.25	0.9118
Jordanian	211	191	1.25	0.9267

Retention rates per millenium of 89.2 %, 91.2 % and 92.7 % are indeed notably higher than the average of about 81 % calculated by Lees for this list, and fall beyond the range of his sample of 13 cases. The rub is a group of 22 items which seem to have synonymous equivalents in Classical Arabic. The three dialects do not agree in their retentions from among these; if they did, Mr. Samarrai would have chosen a single Classical Arabic equivalent for each item on this basis. As it is, he has included the lot: "These morphemes have been considered 'retained'."[3]

The fact is that each dialect retains one or the other equivalent for an item, hardly ever both. By Mr. Samarrai's procedure, each of these 22 items has twice as much chance as the other test items to be a retention (in one case three times the chance), and the dialects have, so to speak, taken advantage of the opportunity.

Now Swadesh and Lees first proposed to drop items whose proper equivalent was uncertain. Would such a procedure lead to notably different results? The following table shows that the resulting retention rates are not quite as high, but still depart strikingly from Lees' results.

	N_o	N_1	t	k
Egyptian	189	161	1.25	0.879
Iraqi	189	166	1.25	0.902
Jordanian	189	169	1.25	0.914

Dropping items has been found to be

[1] Rate of Morpheme Decay in Arabic, IJAL 25.68–70 (1959).

[2] Robert B. Lees, The Basis of Glottochronology, Lg. 29.113–27 (1953).

[3] P. 69, n. 1. In point of fact, Egyptian once, Iraqi once, and Jordanian thrice retain none of the equivalents for an item, so that the blanket acceptance of these 22 items as retained is in error even were it correct procedure.

more expensive than originally expected. It has become clear that it is advisable to choose a form for each item on the basis of explicit criteria; thus Hoijer chooses the singular form from among suppletive verb stems marking number.[4] Gudschinsky has recommended a chance procedure.[5] Since Mr. Samarrai presents a table of the 22 forms with more than one apparent equivalent, a simple arbitrary procedure is to choose either the first listed equivalent for each item, or the second. In either case, the dialects are found to retain approximately half the lot of 22 items; presumably a chance procedure such as flipping a coin and letting Heads select the first listed equivalent, Tails the second, for each item would give similar results. Of the first listed equivalents, Egyptian retains 11, Iraqi 9, and Jordanian 10. Of the second listed equivalents, Egyptian retains 11, Iraqi, 14, and Jordanian 11. Subtracting from the 22 items involved, we find that Egyptian has 11, Iraqi 13, and Jordanian 12 less retentions than in Mr. Samarrai's procedure if the first listed equivalents are chosen. Egyptian has 11, Iraqi 8, and Jordanian 11 less retentions if the second listed equivalents are chosen.

The consequences for the retention rates are shown in the following two tables.

	N_0	N_1	t	k
Egyptian	211	172	1.25	0.849
Iraqi	211	175	1.25	0.862
Jordanian	211	179	1.25	0.876
Egyptian	211	172	1.25	0.849
Iraqi	211	180	1.25	0.880
Jordanian	211	180	1.25	0.880

Such retention rates adjoin those in Lees' sample without gap, given his higher values of .839, .839, and .854. If added to his individual rates, recalculation of the mean rate-constant with the values of the first table gives .8155 as compared to Lees' value of .8048. (Actually it is .8146 as compared to .8039 when a small arithmetic error in the Coptic figure is corrected).[6]

These results hardly disturb Lees' statement: "We take this to mean that on the average about 81% of the basic-root-morphemes of a language will survive as cognates after 1000 years".[7] (This percentage of course presumes the particular test-list).

The statement just quoted continues: "for all languages, at all times," but present evidence does not permit a verdict. Swadesh has remarked that lexicostatistics has thus far operated on a shoe-string of basic research, and the remark remains true. The basis of glottochronology needs empirical exploration wherever the attestation of an earlier stage of a language permits. Mr. Samarrai's work is valuable, especially since it is outside the Indo-European family, which has contributed the bulk of the control cases from which the retention-rate has been estimated. But to be clearly valuable for all the questions raised by the basis of glottochronology, such work must meet the requirements exemplified by Hoijer's Athapaskan study[8] and phrased by Kroeber: (1) the full list of items used to represent the each language or dialect must be made available; (2) judgments as to cognateness or noncognateness must be specified.[9] Kroeber adds that incomplete lists can affect retention rates, and that substitution from outside the list to fill lacunae can make matters worse. This leads to a third requirement: (3) the list should be completed by a choice among alternatives, based on explicit criteria, rather than reject items, wherever possible; if supplementary items must be added, the effect of their use should be determined.

[4] Harry Hoijer, The Chronology of the Athapaskan Languages, IJAL 22.219–232 (1956).

[5] Sarah Gudschinsky, The ABC's of Lexicostatistics (Glottochronology), Word 12.175–210 (1956).

[6] Morris Swadesh, Towards Greater Accuracy in Lexicostatistic Dating, IJAL 21.121–137 (1955), p. 131.

[7] Lees, op. cit., p. 119.

[8] Op. cit.

[9] A. L. Kroeber, Romance History and Glottochronology, Lg. 34.454–457 (1958), p. 457.

Elsewhere I have critically evaluated the basis of glottochronology and pointed to a number of unresolved questions.[10] Despite such limitations, it is still striking that Hattori's study of Japanese dialects,[11] the Sjobergs' study of Dravidian Kannada[12] (when the retention-rate per millenium is examined), and Samarrai's study of Arabic dialects should all fit into the range of Lees' original 13 control cases. The tendency of basic vocabulary to be replaced at a regular rate continues to enjoy preponderant empirical support.

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CLASSIFICATION OF KIOWA NOUNS

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Wonderly, Gibson, and Kirk[1] have set up four classes of Kiowa nouns on the basis of implicit categories[2] relative to distribution with the noun suffix {-gɔ̀} and the demonstratives ɛ́- *near* and óy- *remote*. Since all nouns may occur as objects of verbs, and since the number categories into which the nouns fall according to distribution with the noun suffix (viz. singular, dual, plural, and inverse) are also reflected in the choice of the verb prefix, nouns may also be classified by their distribution as object within the same clause with a verb bearing a prefix indicating one of these four number-categories for object. Such a classification relative to distribution with verbs yields the same classes as set up by WGK with the further defining of their class II into two subclasses. We are also able to reevaluate and more clearly define the implicit categories assigned to each class.

Class I nouns were defined by WGK according to their distribution with noun suffix {-gɔ̀} *inverse* as 'containing an implicit meaning of dual/singular; this is designated the BASIC . . . number of the class I stem.[3] An analysis of the distribution of these nouns as objects of verbs yields the same classification since the selection of the verb prefix indicates singular, dual, and inverse object when the nouns of this class occur as singular, dual, and plural object respectively. For example, when a class I noun occurs as a third person singular object as in the phrase nɔ́· báɔ̀ gyà-kɔ́·tɔ́hɔ́·gyà *I cat I-it-bought*, the prefix gyà- is selected which signals first person singular agent and basic singular object. Further, when a class I noun occurs as a third person dual object as in the phrase nɔ́· báɔ̀ nɛ́n-kɔ́·tɔ́hɔ́·gyà *I cats I-two-of-them-bought*, the prefix nɛ́n- which signals first person singular agent and dual object is selected. Finally, when a class I noun occurs as a third person plural object as in the phrase nɔ́· báɔ̀-dɔ̀ dé-kɔ́·tɔ́hɔ́·gyà *I cats I-them-bought*, the prefix dé- is selected which signals first person singular agent and inverse object (note also inverse suffix -dɔ̀[4] on báɔ̀ *cat*).

Class II nouns were defined as basic dual/plural by WGK. This class must be subdivided into two subclasses according to distribution with verbs.

A class II[a] is determined by selection of verb prefixes which mark these nouns as inverse, dual, and plural objects when they occur as singular, dual, and plural objects respectively. These stems may be described

[10] D. H. Hymes, The Strategy of Lexicostatistics, Current Anthropology (in press).

[11] Shiro Hattori, On the Method of Glottochronology and the Time-Depth of Proto-Japanese, Gengo Kenkyu, nos. 22, 23, pp. 29–77 (1953).

[12] Swadesh, Some Limitations of Diffusional Change in Vocabulary, AA 58.301–306 (1956).

[1] Wonderly, Gibson, and Kirk, Number in Kiowa, IJAL 20.1–7 (1954), hereafter referred to as WGK.

[2] The concept of implicit categories as presented here was first presented by Hermann Aschmann and William L. Wonderly in their article Affixes and Implicit Categories in Totonac Verb Inflection, IJAL 18.130–145 (1952).

[3] The suffix {-gɔ́} may occur on both nouns and demonstratives and is analyzed as the same morpheme marking 'inverse number; i.e. it inverts the basic number to the categories not implicit in the stem. Thus it changes the dual/singular of class I to plural, and the dual/plural basic number of class II to singular' (WGK pg. 2f).

[4] an allomorph of {-gɔ̀}.

as basic dual/plural (as previously defined). e.g. á·dɔ̀ dé-hɔ́·gyà *stick I-it-got* (with inverse suffix -dɔ̀ on á· *sticks*), á· nɛ́n-hɔ́·gyà *sticks I-two-of-them-got*, and á· gyàt-hɔ́·gyà *sticks I-them-got* (three or more).

A class II[b] is determined by selection of verb prefixes which mark these nouns as inverse, dual, and singular objects when they occur as singular, dual, and plural objects respectively. These nouns may be described as basic dual/collective plural; collective plural being defined as 'three or more items marked by the verb prefix as a unit,' e.g. hɔ̨́·gyà dé-hɔ́·gyà *gun I-it-got* (with inverse suffix -*gyà* on hɔ̨́· *guns*), hɔ̨́· nɛ́n-hɔ́·gyà *guns I-two-of-them-got*, and hɔ̨́· gyà-hɔ́·gyà *guns I-it-got*.

Class III nouns were defined as basic dual according to distribution with noun suffix {-gɔ̀} *inverse*. An analysis of the distribution of these nouns with verb prefixes causes us to re-define class III nouns as basic dual ± collective plural. These nouns occur with verbs with prefixes which mark them as inverse or dual objects when they occur as singular or dual objects respectively as in álɔ̀-bɔ̀ dé-hɔ́·gyà *apple I-it-got* (with inverse suffix -bɔ̀ on álɔ̀ *apples*) and álɔ̀ nɛ́n-hɔ́·gyà *apples I-two-of-them-got*. When they occur as plural objects, they may be marked by noun suffix {-gɔ̀} *inverse* along with the prefix on the verb in two formally different ways: they may be marked as inverse objects as in álɔ̀-bɔ̀ dé-hɔ́·gyà *apples I-them-got* (three or more), or they may be marked as basic singular objects as in álɔ̀ gyà-hɔ́·gyà *apples I-it-got*.

Class IV nouns were classified as basic dual/singular/plural since they never occur with noun suffix {-gɔ̀} *inverse*. Class IV was tentatively subdivided into three subclasses by WGK on the basis of distribution within the same clause with verbs. We are now able to verify this tentative subclassification and assign distinct implicit categories to each subclass.

A Class IV[a] is determined by selection of verb prefixes which mark these nouns as singular, dual, and plural objects when they occur as singular, dual, and plural objects respectively. These nouns may then be considered basic dual/singular/plural (as previously defined). e.g. cʔó gyà-kɔ̨́ *stone I-it-brought*, cʔó nɛ́n-kɔ̨́ *stones I-two-of-them-brought*, and cʔó gyàt-kɔ̨́ *stones I-them-brought* (three or more).

A Class IV[b] is determined by a selection of verb prefixes which mark these nouns as singular, dual, and singular objects when they occur as singular, dual, and plural objects respectively. These nouns may then be considered basic dual/singular/collective plural. e.g. tó· gyà-hɔ́·gyà *house I-it-got*, tó· nɛ́n-hɔ́·gyà *houses I-two-of-them-got*, and tó· gyà-hɔ́·gyà *houses I-it-got*.

A Class IV[c] is determined by a selection of verb prefixes which mark these nouns as plural objects when they occur as singular, dual, or plural objects. I term the implicit category of these stems as distributive plural where perhaps even a single item is looked upon as having several constituent parts.[5] E.g. kút gyàt-hɔ́·gyà *books I-one-or-more-of-them-got*.

Since the classification of nouns based upon distribution with verb prefixes divides WGK's class II into two subclasses, I list below their class II nouns as subdivided into the two subclasses. All other nouns as listed by WGK remain in their respective classes.

Class II[a] nouns are: ɔ́lpᵇą̀· *ribbons*, àypʔíè *potatoes*, áydɛ́ *leaves*, tᵇɔ̨́·sɛ̀· *bones*, á· *sticks*, tᵇá·dè *matches*, mɔ̀cʔą́y *papers*, ákᵇį̀· *flowers*, dɔ̨́· *seeds*, pɔ̨́· *beads*, zɛ́· *arrows*, áɔ̀kᵇɔ̀y *boxes*, bímkᵇɔ̀y, *sacks*, sól *onions*, kʔɔ̀ál *dishes*.

[5] In a word like kút *book* in view of the fact that the word also means *marking, painting*, etc. it is conceivable to the speaker of English that there might be reference to a number of marks or something to that effect when referring to a book. This type of reference is also conceivable in the word kʔɔ́lpᵇą̀ *necklace* (which is made up of long bone beads), but in other words like hɔ́ldà *dress* and tʔɔ̨́·gyà *shirt* it is not so apparent what the plural significance might be.

Class II^{b} nouns are: pàlhá· *bows*, á· *trees*, mónsó·dè *bracelets*, p^{h}ɔ̀á·té *balls*, ɔ̀nsó *feet*, hɸ́· *guns*, c$^{?}$ɔ̀· *feathers*, kɔ́bɔ̀t *boats*, k$^{?}$óp *mountains*, cát *doors*, kútá· *pencils*, é·t^{h}àl *corn*, t$^{?}$ɸ́y *sheets*.

It is interesting to note that the ambiguity which a noun may have when standing alone with demonstratives is in many cases resolved when it occurs with a verb. For example, a class I noun has an ambiguous basic number of dual/singular. Also some of the plural person-number categories of verb prefixes are ambiguous as to dual and plural. These ambiguities in both nouns and verb prefixes are mutually resolved when the nouns occur as referents with verbs. This can be illustrated by the class I noun pà·bì *brother* in the following expressions: ám gɔ̀ á-pà·bì mɸ́-góp *you and your-brother* (*du/sg*) *I-you-two-hit*, ám gɔ̀ á-pà·bì bɔ́-góp *you and your-brother* (*du/sg*) *I-you-all-hit* (i.e. I hit you and your two brothers), ám gɔ̀ á-pà·bì-ɔ̀p bɔ́-góp *you and your-brothers* (*pl*) *I-you-all-hit* (i.e. I hit you and your three or more brothers).

SUMMER INSTITUTE OF LINGUISTICS

AN ETYMOLOGY FOR "PIDGIN"

DAVID KLEINECKE

The word 'pidgin', now used almost exclusively in the compound 'Pidgin English', is traditionally etymologized as a corruption of "business" created by the non-English speakers of Chinese Trade Pidgin.[1] Robert A. Hall is clearly disturbed by the phonetics involved in this derivation and suggests an intermediate form like 'bishness'.[2] This note is intended to call attention to an almost certain early use of the word (in the West Indies!) and its derivation from America.

In 1605 Captain Charles Leigh planted a colony at the mouth of the Oyapock River (today the boundary between Brazil and French Guiana). There the colonists found a frequently visited Indian community dominated by Yayos (Cariban speakers) and including Lokonos (that is, true Arawaks) and Shebayos (probably also Arawakan, but of an entirely different substock).[3] The Yayos, who may be the original inhabitants of Trinidad, had led the group eastward about 1600; the old inhabitants of the Oyapock basin—Arracaries, Marraons, etc.—had withdrawn inland, unfriendly but not at war. As usual the colonists importuned the Indians for supplies; ultimately, however, according to the Relation of Master John Wilson,[4] the colonists suffered "great want of victuals, for that the Pidians could not at all times provide them that they wanted."

If Master Wilson had written 'Indians' instead of "Pidians" the sentence just quoted would not have been out of the ordinary; but the unique word "Pidians" appears. The meaning is clear enough to show that "Pidians" is meant for a cover term for the Oyapock Indians. Now, in western Guiana '-pidian' is a recognized element in some tribal names, for example: Mapidian, Tarapidian, Wapishana, etc. This shows that the citation is not a misprint and that the meaning derived from context is reasonable. The aboriginal etymology of "pidian" cannot be traced in the present state of South American Indian historical linguistics; but because other American terms used by Wilson—maipure *tapir*, for example—seem to be Cariban, "pidian" is probably a Yayo word meaning *people*.

The colony failed in 1606, but the Oyapock community was visited again and again until about 1650 when it vanished. After this we hear of a tribe (not mentioned before) on the middle Oyapock called Piriouns[5]; the people, and the name, seem to have moved inland.

[1] The Oxford English Dictionary. Oxford, 1933.

[2] Hall, Robert A. Hands Off Pidgin English. Sidney, 1955.

[3] de Goeje, C. H. Nouvel Examen des Langues des Antilles. JSAP 31 (1939).

[4] Purchas, Samuel. Purchas His Pilgrimes. First edition, 1625.

[5] Lombard, Aimé. Recherches sur les tribus indiennes. JSAP 20 (1928).

Even though it is inferential the rest of the history of the word seems to be straightforward. It must have been carried from the West to the East Indies by English sailors; the India trade was just beginning in 1606. At the time the word "pidgin" probably meant something like *native who is willing to trade*. Its history for the next two centuries is undocumented but it must have been retained in the China Trade Pidgin until it reappeared about 1850. It is possible that Wilson intended the word to be pronounced 'pigeon'; in any case the phonetic development of the middle consonant is a frequent one paralleled by "Indian" and "Injun", for example.[6]

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[6] Jespersen, Otto. A Modern English Grammar. Heidelberg, 1922.

NOTE ON ST. FRANCIS NOMENCLATURE

GORDON M. DAY

In Swanton's tribal synonymy[1] the Abenakis' name for themselves was given as "Alnânbaĭ," which was said to mean *Indians* or *men*. Swanton[2] was quoting Mooney and Thomas,[3] whose authority is given as Vassal.[4] The pertinent part of Vassal's statement in full is: "Alnânbaĭ Menahan—Indian Island. An island in the River St. Francis belonging to the Indians and called by the Canadians 'Isle Ronde,' Round Island, from its shape. 'Menahan,' island; 'Alnânbaĭ,' word used by the Abenakis to designate all the members of the tribe taken as a whole, a community, a people."

[1] John R. Swanton, The Indian Tribes of North America, BAE Bull. 145, (Washington, 1953), p. 13.

[2] Swanton, Indian Tribes, p. 3.

[3] James Mooney and Cyrus Thomas, "Abnaki," in Handbook of American Indians North of Mexico, ed. F. W. Hodge, BAE Bull. 30, (Washington, 1907, 1910), pt. 1, pp. 2–6.

[4] H. Vassal, Letter, Canada Department of Indian Affairs, Ann. Rept. for 1884, (Ottawa, 1885), pt. 1, pp. 26–31.

This is incorrect. Vassal's information was obtained from the St. Francis Indians, whose Agent he was, and in the St. Francis dialect alnǫbáymenahán[5] means both *Indian's island* and *Indians' island*. menahán is indeed *island*. alnǫbá is *an Indian*, not specifically an Abenaki Indian. -y- is a possessive affix, and the form alnǫbáy is never used alone. It is apparent that Vassal either misunderstood his informants or attempted to extrapolate from their data.

A tribe of Indians is often rendered simply by alnǫbák *Indians*. For example, elicit *there is a tribe of Indians over there*, and you may obtain alnǫbák ní odayná *Indians there they are; a large tribe of Indians* may obtain msalók alnǫbák *many Indians*. More specific designation of *the tribe* or *the band* employs the root mǫka-, for example, mǫ́kawinnó *a member of the band*; mǫ́kawinnoák *members of the band*; mǫkáwigawzák *the band's cows*; mǫkáwimenahán *the band's island*. Reference to the band's reservation constitutes an exception to this usage. One might compose mǫkáwikí *the band's land*, but it is not used. The common expression is kədákiná *our land*. These terms designate an ethnic group, not a temporary gathering. A gathering for social or political purposes, *an assembly*, is maahlǫ́n. For example, maahlǫ́n wadzi pəmegǫmék *a gathering for a dance*; maahlǫ́n wadzi klozimék *people gathered for talking*; maahlǫ́n wadzi podawazimék *a council, group for talking things over*. nyoná mǫ́wiwí *we all together, all of us* is a general term.

The St. Francis Indians now call themselves wǫbanakí, *Abenaki*, plural wǫbanakiák, and they admit under the name all Indians whose language they understand easily. All agree in including the Penobscots and the Indians of Becancour. They distinguish themselves from these other Abenakis by such expressions as wǫbanakiák odzi odának *Abenakis from the village (of St. Francis)*; odziaák odának *those from the*

[5] Gordon M. Day, field notes recorded in 1958.

village; and wǫbanakiák yó odzí *Abenakis from here*.

By the above I intend to say only that there is no such independent form in the St. Francis dialect as alnǫbay; that alnǫbá now means simply Indian, not Abenaki; that to specify *a band* or *people* one must employ the root mǫka-; and that the Abenakis of St. Francis now call themselves wǫbanakiák. I do not mean to say that the Abenakis may not at one time have used alnǫbák as their tribal name nor that the name Abenaki may not have been applied originally by a neighboring tribe. These questions and the etymology of Abenaki have puzzled many modern scholars and deserve discussion beyond the scope of this note.

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THE DIFFUSION OF SOME SOUTHWESTERN WORDS FOR CAT

HERBERT J. LANDAR

Glossed as cat are Navaho 'mósí, 'mǫ́sí,[1] Hopi mó·sa,[2] Zuni mu:sa,[3] Keresan mú·s,[4] Tewa mú·sa^h,[5] Taos m|ųsi-?|ina,[6] all presumably with morphemes borrowed after European colonization. These forms confront one with a problem in diffusion; they might involve borrowing from Spanish or from English, either directly or by way of one or more Indian languages.

Accepting two assumptions, one can practically dismiss the possibility of any borrowing from Spanish: (1) words borrowed by the languages in question involved phonetic substitutions, with use of native phones as similar as possible phonetically to foreign phones[7]; (2) Navaho did not borrow borrow Spanish míso *puss*, which then underwent vocalic metathesis.

Spanish dictionaries list gato *cat*, and micho, micha, mizo, miza *puss*. I assume for the sake of argument that these words bore penultimate strong stress, and that for Rio Grande Spanish of the 17th century and later ch represents some kind of [č], z some kind of [s].[8] In terms of Hopi phonetics, míso, mísa, míčo, míča could be borrowed without outlandish substitutions; I doubt the substitution of mó·s- for mís- (cf. Hopi míhi *night*, mí:si *he's aroused*[9]), with a conversion for example of mísa into a Hopi mó·sa, to Spanish ears an absurd mósa *moose*. Similarly, Zuni speakers, with mi- and mi:- sequences (cf. mi *corn ear*, milh *thousand* < Spanish mil[10]), and intervocalic s, ss and č (cf. pasi *sleeve*,[11] mossi *be boss*, ma:chiyali:ta *ruby-throated bluebird*[12]), would hardly make mu:sa from any of the Spanish forms. Nor need Keresan speakers have resorted to u· for Spanish í (cf. ?owi·šp *bishop* < Spanish obispo,[13] sandí·? *watermelon* < Spanish sandía[14]). And speakers of Tewa and Taos also could have borrowed mísa with minor phonetic substitutions; cf.

[1] From my field notes, recorded during work with the Southwest Project in Comparative Psycholinguistics, 1955–56; /'/ before a syllable indicates strong stress.

[2] Charles F. Voegelin and Florence M. Voegelin, Hopi domains, IJAL 23.19 (Mem. 14, 1957); cf. Frederick J. Dockstader, Spanish loanwords in Hopi; a preliminary checklist, IJAL 21.159 (1955): Second Mesa mûsa (/ü/ [œ:] ?), from Spanish miza.

[3] Stanley Newman, Zuni dictionary, IJAL 24.32 (Pt. II, 1958); mu:sa has penultimate strong stress.

[4] Robert F. Spencer, Spanish loanwords in Keresan, Southwestern Journal of Anthropology 3.141 (1947); Spencer doubts that mú·s is from Spanish micho.

[5] Edward P. Dozier, Two examples of linguistic acculturation: the Yaqui of Sonora and Arizona and the Tewa of New Mexico, Lg. 32.154 (1956): mú·sa^h from English pussy by way of Spanish musa, musi.

[6] George L. Trager, An outline of Taos grammar, in Harry Hoijer, ed., Linguistic structures of native America, Viking Fund Publications in Anthropology 6 (1946), p. 216.

[7] Cf. Leonard Bloomfield, Language (1933), p. 446.

[8] Cf. Dozier, p. 154.

[9] Voegelin, p. 24 (A 10.1), p. 28 (B 1.2).

[10] Newman, p. 31.

[11] Ibid., p. 93.

[12] Ibid., p. 30.

[13] Spencer, p. 137.

[14] Ibid., p. 141.

Tewa paloma[h] *pigeon* < Spanish palóma, pú·sę̀·ʔi? *radish*,[15] Taos mɨuoya?ɨana *steer, ox* < Spanish buey.[16] (The strongest argument that confronts Spanish músa *pussy* as a loan from English, even supposing that the stem took a masculine -o and a feminine -a suffix through analogical change, is that one would expect Spanish púsa not músa.)

The assumption that Navaho 'mósí *cat* is a metathesized form of Spanish míso *puss* finds support first in the fact that Navaho m is rare,[17] and second in the fact that m in inherited words probably occurs only before the reflex of Proto-Apachean *a.[18] On the other hand, the assumption loses support when faced with the rarity of Navaho metathesis. I know only one case, and it involves consonants not vowels: di 'ʒé̀ coh *peach* (di 'ʒé *berry*, -coh *big*), with a metathesized variant ʒi'dé̀coh heard occasionally in eastern Navaho country.[19] I prefer not to accept the second assumption.

Even if Navaho 'mósí *cat* (with a nasalized variant 'mǫ́sí perhaps by progressive assimilation) is not from Spanish míso *puss*, the Navaho forms may have been borrowed by one or more Southwestern languages, for the Pueblos, hostile to things Spanish,[20] could be expected to favor Indian as against Spanish loanwords. Note that Taos mɨuṣi-ʔɨina ({muṣi} 'cat' + {-ʔina} 'absolute singular') has u; if the initial morpheme was borrowed by speakers of Taos[21] it probably was patterned on Navaho 'mǫ́sí. Navaho /o/ is a high back vowel with an allophonic range that includes [u], and while progressive assimilation is possible in Taos no less than in Navaho, I prefer Taos mɨuṣi- < Navaho 'mǫ́sí.

Clear now, I think, is the complexity of this problem, whose solution in any form has to be couched in qualifications. One might argue for example that the initial syllable of Zuni mu:sa was borrowed by Navaho with the addition of an {-ɬ}-suffix (/hɬ/ after vowels, /ɬ/ elsewhere), meaning something like *the one that*; this suffix occurs in some animal names, for example gał 'báhí *cottontail rabbit* ('gah *rabbit*, łi'bá *it is gray*). But one would have to explain why the Navaho form is 'mósí rather than 'mó·si. In short, facile statements concerning the diffusion of Spanish and English words for *cat* in the Southwest are risky if not rash.

REED COLLEGE

[15] Dozier, p. 154, p. 153; cf. p. 156.

[16] Trager, p. 191.

[17] See Robert W. Young and William Morgan, The Navaho language (1943), pp. 143–144; Berard Haile, A stem vocabulary of the Navaho language (1950), pp. 71–74.

[18] Tentatively, I think that Proto-Apachean *a occurred with and without nasalization, high pitch, strong stress, and length, and that it remains in Navaho: Proto-Apachean *-má·s *roll (an object)* > Proto-Western Apachean *-má·s > Navaho -má·s; cf. San Carlos, Chiricahua, Mescalero, Kiowa Apache -mā́·s. (Attested forms are from Harry Hoijer, The southern Athapaskan languages, AA 40.76 [1938].)

[19] Also heard: an assimilated ʒi'ʒé̀ coh. (/'/ indicates medium stress.)

[20] Dozier, pp. 148, 150–152: speakers of Tewa avoid Spanish loanwords; of Taos, Spanish and English loanwords.

[21] Taos has u as well as ɨ.

RECENT PUBLICATIONS

General Linguistics

Black, Max. Linguistic Relativity: The Views of Benjamin Lee Whorf. Philosophical Review 68.228–238, 1959.

Carroll, John B. An Operational Model for Language Behavior. AL 1.1, 37–54, 1959.

Chomsky, Noam. A Review of B. F. Skinner Verbal Behavior. Language 35.26–57, 1959.

Garvin, Paul L. and Madeleine Mathiot. Fused Units in Prosodic Analysis. Word 14.178–186, 1958.

Gipper, Helmut (ed.). Sprache, Schlüssel zur Welt. Festschrift für Leo Weisgerber. Düsseldorf: Pädagogischer Verlag Schwann, 1959. Pp. 385.

Gleason, H. A., Jr. Counting and Calculating for Historical Reconstruction. AL 1.2, 22–32, 1959.

Goodglass, H. and J. Hunt. Grammatical Complexity and Aphasic Speech. Word 14.197–207, 1958.

Haas, W. Relevance in Phonetic Analysis. Word 15.1–18, 1959.

Hall, Robert A., Jr. Creolized Languages and "Genetic Relationships". Word 14.367–373, 1958.

Hall, Robert A., Jr. Terminological notes. SIL 13.71–72, 1958.

Harris, Zellig S. The Transformational Model of Language Structure. AL 1.1, 27–30, 1959.

Hill, Archibald A. Linguistics and the College Teacher of Language, Literature or Composition. Jour., College Language Assoc. 2.75–86, 1958.

Hymes, Dell H. Genetic Classification: Retrospect and Prospect. AL 1.2, 50–66, 1959.

Jensen, Martin Kloster. Recognition of Word Tones in Whispered Speech. Word 14.187–196, 1958.

Joos, Martin. Semology: a linguistic theory of meaning. SIL 13.53–70, 1958.

Lamb, Sydney M. Some Proposals for Linguistic Taxonomy. AL 1.2, 33–49, 1959.

Lees, R. B. Automata and the Generation of Sentences. AL 1.4, 1–4, 1959.

Mattoso Camara, J. Princípios de Lingüística Geral. Rio de Janeiro: Livraria Acadêmica, 3rd ed., 1959. Pp. 406.

Proceedings of the Eighth International Congress of Linguists. Oslo: Oslo Univ. Press, 1958. Pp. XXXI, 881.

Reiss, Samuel. Language and Psychology. New York: Philosophical Library, 1959. 299 pp.

Riffaterre, Michael. Criteria for Style Analysis. Word 15.154–174, 1959.

Swadesh, Morris. Linguistics as an Instrument of Prehistory. SJA 15.20–35, 1959.

Swadesh, Morris. The Mesh Principle in Comparative Linguistics. AL 1.2, 7–14, 1959.

Trager, George L. The Systematization of the Whorf Hypothesis. AL 1.1, 31–36, 1959.

Voegelin, C. F. Model-Directed Structuralization. AL 1.1, 9–26, 1959.

Weinreich, Uriel. On the Compatibility of Genetic Relationship and Convergent Development [A comment on Taylor, Word 12.407 and Hall, Word 14.367.] Word 14. 374–379, 1958.

Weinreich, Uriel. Travels Through Semantic Space [A review of Osgood, Suci, and Tannenbaum, The Measurement of Meaning.] Word 14.346–366, 1958. [See also John Carroll's review, in Language 35.58–77, 1959; and Charles Osgood, Semantic Space Revisited, Word 15.192–199, 1959.]

Worth, Dean Stoddard. "Linear Contexts," Linguistics and Machine Translation. Word 15.183–191, 1959.

American Indian Languages

Anderson, Arabelle. Two Chol Texts. Tlalocan 3.313–316, 1957.

Anderson, Lambert. Vocabulario Breve del Idioma Tuçuna. Tradicion, Rev. Peruana de Cultura, Año 8, no. 21, 1958.

Baldus, H. Contribuição à lingüística gê. Miscellanea Paul Rivet, II.23–42, 1958.

Beasley, David, and Kenneth L. Pike. Notes on Huambisa Phonetics. Lingua Posnaniensis 6.1–8, 1957.

Blixen, Olaf. Acerca de la Supuesta Filiación Arawak de las Lenguas Indígenas del Uruguay. Montevideo: Univ. de la Republica, 1958. Pp. 44.

Bowman, Elizabeth. An Attempt at an Analysis of Modern Yucatec from a Small Corpus of Recorded Speech. AL 1.4, 43–86, 1959.

Croft, Kenneth. Nahuatl Texts from Matlapa, S. L. P. Tlalocan 3.317–333, 1957.

Gudschinsky, Sarah C. Native Reactions to Tones and Words in Mazatec. Word 14.338–345, 1958.

Haas, Mary R. Tonkawa and Algonkian. AL 1.2, 1–6, 1959.

Hanke, W., M. Swadesh, and A. Rodrigues.

Notas de Fonología Mekens. Miscellanea Paul Rivet, II.187–218, 1958.

Ibarro Grasso, D. E. Las formas de contar de los pueblos primitivos y las influencias lingüísticas surasiáticas y oceánicas en la América Indígena. Miscellanea Paul Rivet, II.269–296, 1958.

Kutscher, G. Ein von Walter Lehmann gesammeltes Mexicano-Märchen und Vokabular (Mexicano de Chilapa, Staat Guerrero). Miscellanea Paul Rivet, I.533–572, 1958.

Lauriault, Jaime. Textos Quechuas. Tradicion, Rev. Peruana de Cultura, Año 8, no. 21, 1958.

Law, Howard W. Tamákasti: A Gulf Nahuatl Text. Tlalocan 3.344–360, 1957.

Longacre, Robert E. Trique Tone Morphemics. AL 1.4, 5–42, 1959.

Matteson, Esther, and Kenneth L. Pike. Non-Phonemic Transition Vocoids in Piro (Arawak). Miscellania Phonetica 3.22–30, 1958.

Miscellanea Paul Rivet, Octogenario Dicata. Mexico: Pub. del Instituto de Historia, Primera Serie, No. 50, 1958. Two volumes, pp. 707, 903.

Paula Martins, M. de L. de. Vocabulario botocudo de Charles Frederick Hartt. Miscellanea Paul Rivet, II.405–430, 1958.

Pike, Kenneth L., Ralph P. Barrett and Burt Bascom. Instrumental Collaboration on a Tepehuan (Uto-Aztecan) Pitch Problem. Phonetica 3.1–22, 1959.

Powlison, Paul y Esther. El Sistema Numerico del Yagua (Pebano). Tradicion, Rev. Peruana de Cultura, Año 8, no. 21, 1958.

Russell, Robert. Algunos Morfemas de Amahuaca (Pano) que Equivalen a la Entonacion del Castellano. Sobretiro de Peru Indigena, 7.29–33, 1958.

Sisler de Insley, Jeanne Forrer. Sambo, un Cuento Piro. Sobretiro de Folklore Americano, Año V, no. 5, 1957.

Voegelin, C. F. Linguistic perimeters in Latin America. Miscellanea Paul Rivet, I.197–212, 1958.

Wise, Mary Ruth. Diverse Points of Articulation of Allophones in Amuesha (Arawak). Miscellanea Phonetica 3.15–21, 1958.

Wise, Mary Ruth, and Martha Duff. Vocabulario Breve del Idioma Amuesha. Tradicion, Rev. Peruana de Cultura, Ano 8, no. 21, 1958.

Journals Received

America Indigena, vol. 19, nos. 1, 2, 1959.

American Speech, vol. 34, no. 1, 1959.

Anthropological Linguistics, vol. 1, no. 1, Jan., 1959; vol. 1, no. 2, Feb., 1959; vol. 1, no. 3, Mar., 1959; vol. 1, no. 4, April, 1959.

Antropologia e Historia de Guatemala, vol. 10, no. 2, 1959.

Archivum Linguisticum, vol. 10, fasc. 2, 1958.

Boletin Indigenista, vol. 19, no. 1, March, 1959.

General Linguistics, vol. 3, no. 3 (Supplement), 1959.

The Japanese Journal of Ethnology, vol. 22, no. 3–4, 1959.

Language, vol. 35, no. 1, 1959.

The Muslim World, vol. 49, no. 1, 1959.

Oceania, vol. 29, no. 2, 1958.

Ricerche Linguistiche, Bolletino di Glottologie dell' Università di Roma. Vol. 4, 1958.

Studies in Linguistics, vol. 13, no. 3–4, 1958.

Tlalocan, Revista de Fuentes para el Conocimiento de las Culturas Indígenas de México, vol. 3, no. 4, 1957.

Word, vol. 14, no. 2–3, August-December, 1958; vol. 15, no. 1, April, 1959.

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